FILE COPY

JAN 24 1928

CHARLES ELMORE CROPLEY
CLERK

In the Supreme Court of the United States.

OCTOBER TERM, 1927

No. [redacted]

5, Original

THE STATE OF COLORADO,
Complainant,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,
Defendants.

MOTION FOR LEAVE TO FILE ORIGINAL BILL OF COMPLAINT IN EQUITY AND ORIGINAL BILL OF COMPLAINT

WILLIAM L. BOATRIGHT,
Attorney General of the State of Colorado.

PLATT ROGERS,
JAMES GRAFTON ROGERS,
FRED A. SABIN,
HENRY A. DUBBS,
A. WATSON MCHENDRIE,
Of Counsel.

RALPH L. CARR,
Assistant Attorney General,
Solicitors for Complainant.

THE SMITH-BROOKS PRESS, DENVER

In the Supreme Court of the United States.

OCTOBER TERM, 1927

No. .....

THE STATE OF COLORADO,

Complainant,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,

Defendants.

ORIGINAL

MOTION FOR LEAVE TO FILE BILL OF COMPLAINT IN EQUITY

To the Honorable, the Chief Justice and the Associate Justices of the Supreme Court of the United States:

The State of Colorado, a sovereign State of the Union, appearing by William L. Boatright, its Attorney General, upon direction of his Excellency, William H. Adams, Governor of the State of Colorado, respectfully moves for leave to file as an original cause in this court its Bill of Complaint in Equity against the State of Kansas and The Finney County Water Users' Association, a private corporation, a citizen of Kansas, which Bill of Complaint is submitted herewith.

The State of Colorado respectfully shows that in an original proceeding in this Court, commenced by the sovereign State of Kansas on or about May 20, 1901 and concluded on or about May 13, 1907, and reported under the name *Kansas vs. Colorado*, in 185 United States Reports, 125, and 206 United States Reports, 46, this Supreme Court considered and adjudicated the claims of the State of Kansas and of the State of Colorado and their respective citizens and inhabitants to the use and flow of the waters of the Arkansas River, a stream originating in the State of Colorado and flowing into and through the State of Kansas; that in the final decree in said cause this Supreme Court determined that the use and diversion of the waters of the Arkansas River to the extent then established and practiced by the State of Colorado did not exceed the equitable limitations on the exercise of sovereignty by the State of Colorado on the said river, and dismissed the bill of complaint of the State of Kansas, and held that if thereafter the State of Colorado, its citizens and inhabitants, should increase the diversion and use of the waters of said river so materially that the substantial interests of Kansas were being injured, and the equitable apportionment of benefits between the States was destroyed, that the State of Kansas might reinstitute proceedings against the State of Colorado. In spite of the said adjudication, suits by private individuals, and particularly by The Finney County Water Users' Association, a corporation of Kansas, have been instituted against individuals and corporations in Colorado without impleading or attempting to implead either the State of Colorado or the State of Kansas, and these private suits attempt to overturn and will, if continued, overturn and render nugatory the above mentioned adjudication between the States, defeat the government ownership and control by the State of Colorado of its streams and the use of the waters thereof, and terminate the orderly and proper administration and policy of the State of Colorado over the waters of the Arkansas River within its own boundaries. The State

of Colorado now prays leave to file its Bill in Equity in the nature principally of a bill of peace, offering to do justice to the State of Kansas whenever said State shall desire to complain in this Court of the actions of Colorado, its citizens and inhabitants, but praying that the Court may, by reasons of facts and doctrines fully set forth in the bill, prevent the continuance of the private litigation which, as the State of Colorado believes and alleges, will, if continued, destroy its sovereignty, prevent the economic development of irrigation on the Arkansas River both in Colorado and Kansas, prevent the State of Colorado from carrying out a policy of governmental control and ownership of the waters of the Arkansas River which is necessary for the development of agriculture and civilization itself, and rob the State of Colorado, its citizens and inhabitants, of the fruits of the litigation in the above-mentioned cause of *Kansas vs. Colorado.*

WHEREFORE, the State of Colorado prays leave to file its Original Bill of Complaint as above stated.

Respectfully submitted,

THE STATE OF COLORADO,
By WILLIAM L. BOATRIGHT,
Attorney General of the
State of Colorado.

RALPH L. CARR,
Assistant Attorney General,
Solicitors for Complainant.

In the Supreme Court of the United States.

OCTOBER TERM, 1927

No. .....

THE STATE OF COLORADO,

Complainant,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,

Defendants.

ORIGINAL

BILL OF COMPLAINT IN EQUITY

The State of Colorado, a State of the Union, appearing in its sovereign capacity by its Attorney General upon direction of its Governor, by leave of Court files this, its Bill of Complaint, and respectfully sets forth:

FIRST

The parties hereto are your Complainant, the State of Colorado, a State of the Union admitted to and exercising equal sovereignty with the original and all other States of the Union, and the defendants, the State of Kansas, a like

sovereign and equal State of the Union, and The Finney County Water Users' Association, a corporation.

SECOND

The Finney County Water Users' Association is a corporation duly organized and existing under the laws of the State of Kansas, incorporated primarily for the purpose of owning, maintaining and operating an irrigation canal, taking water from the Arkansas River, in the State of Kansas, for the purpose of irrigating lands in said state. Its offices and place of business are in the State of Kansas, it carries on business wholly within the said state, and it is a citizen; resident and inhabitant of the State of Kansas and not of any other state.

THIRD

The Arkansas River is a non-navigable stream rising among the higher ranges of the Rocky Mountains, near the center of the State of Colorado, flowing thence southeasterly and easterly through the central portion and the southern portion of Colorado for a distance of about three hundred miles to the boundary between Colorado and Kansas, and thence for a distance of about two hundred miles through southwestern and south central Kansas, leaving that state at its southerly boundary to enter the State of Oklahoma. It flows thence through Oklahoma and Arkansas for several hundred miles before reaching the Mississippi River. Throughout its course in Colorado, the main stream of the Arkansas River traverses an arid country, consisting first of mountain valleys along which considerable agricultural crops are grown by the process of irrigation, and thereafter for about two hundred miles, consisting of the Great Plains, across which the river flows in a valley almost entirely of shifting sand, the slopes of which are scarcely distinguishable from the flat contours of the open prairie. The river is joined in its course in Colorado by numerous small mountain tributaries and on the plains by several large floodwater

tributaries deriving their water from the slopes of the Rocky Mountains and the drainage from great areas of the relatively level plains. Throughout the course of the river and its tributaries in Colorado the rainfall is insufficient to support agriculture without the aid of irrigation; there are no material sources for water either in wells, or subterranean flows which are worthy of consideration, and, therefore, in addition to the demands for agriculture, several considerable cities and a great number of towns, villages and hamlets are dependent upon the water flowing in the channel of the Arkansas River for domestic and manufacturing uses, fire protection, and all of the customary requirements of a human population. The annual precipitation, in the form of snow and rain in those lands in Colorado bordering the river and its tributaries which are susceptible of supporting the homes and industries of men, gradually increases from a minimum of about ten inches per annum, in the regions where the river first ceases to be a mountain stream and becomes available for agricultural and domestic use, to about fifteen inches at the eastern border of Colorado, the precipitation on the whole throughout the district traversed by the river and its tributaries tending gradually to increase as the river approaches the Kansas border.

The Arkansas River and its tributaries constitute one of the principal foundations for human population, agriculture, industry, life, prosperity and happiness within the borders of Colorado, and a large part of the present population of the state is dependent upon the use of the waters flowing in the said stream, and to a lesser extent in its tributaries, for carrying on the arts and industries of life, and for maintaining existence itself. Fourteen counties in the State of Colorado, namely, Lake, Chaffee, Custer, Fremont, Pueblo, El Paso, Huerfano, Otero, Crowley, Las Animas, Baca, Kiowa, Prowers and Bent (many of them of vast extent) are dependent upon the Arkansas River and its tributaries within the state for the fundamental requirements of life, and

more than 640,000 acres devoted to agriculture are and for many years have been entirely dependent upon the Arkansas River and its tributaries for irrigation water, and would without its continued use and availability revert to deserted prairies within a few months. The cities of Pueblo with a population of more than 50,000 people, Colorado Springs with a population of more than 30,000 people, Trinidad with a population of more than 12,000 people, Canon City, Salida and La Junta, with a population of more than 5,000 each, Rocky Ford and Walsenburg with a population of more than 4,000 people each, Lamar with a population of more than 3,000 people, and a large number of smaller cities, towns and settlements, with industries such as the great iron and steel plants at Pueblo, a number of important factories for the manufacture of sugar from beets, alfalfa mills, flour mills, electric light plants, and a great variety of other manufacturing enterprises, are dependent for all the demands for water incident to urban and suburban life and prosperity upon water taken from the natural discharge of the Arkansas River and its tributaries. Approximately 150,000 people live in the cities, towns and villages of this district, and an additional 50,000 people are located outside of cities, towns and villages on farms and agricultural lands. More than $20,000,000 has been expended in the construction of ditches and canals for agricultural purposes, and probably as much more in the construction of municipal and manufacturing facilities for the diversion and use of water by cities, towns, and the industries located within them. Under the prevailing state of the arts for the use and conservation of water and the conditions of commerce justifying the same, the territory in Colorado tributary to the Arkansas River showed a steady increase in population and development until about the year 1900, since which time there has been no substantial alteration in the quantity of water beneficially applied within the state, although the permanence of the settlements, the population dependent upon the river, and the industries and public and private institutions based thereon, by a gradual increase

of knowledge, stabilization of conditions and the other elements incident to age and permanency of occupation, have been substantially increased. Great numbers of public institutions, schools, colleges, county and municipal buildings and enterprises, penal and charitable institutions, have been gradually established in the territory supplied by the river and its tributaries by the authority of this sovereign state and the expenditure of large sums of public moneys raised by taxation. Several railroads, including a substantial part of the so-called Santa Fe System, Denver and Rio Grande Western System, the Missouri Pacific System and Colorado and Southern System have for a generation past served this district and are materially dependent for success upon the flow of the Arkansas River and its tributaries.

FOURTH

After entering the State of Kansas the river travels for substantially a hundred miles through a district in which the rainfall, in a gradually increasing degree towards the east, becomes more sufficient for the growth of crops and the support of settlements without the aid of irrigation, but for about this distance irrigation has been practiced more or less spasmodically, and practically 40,000 acres of agricultural land did prior to 1900 derive and since continue to derive water from the river and its tributaries within the State of Kansas for supplemental use in ordinary years, and principal use in years of unusual drouth, but by reason of natural conditions the State of Kansas has not been required to develop and has not developed irrigation institutions, irrigation structures or irrigation law and practices at all comparable with those developed in Colorado, and the riparian doctrine (as was asserted by Kansas and found by the Supreme Court in the case of Kansas vs. Colorado, hereinafter mentioned) prevails throughout the State of Kansas.

FIFTH

The State of Colorado has been conscious from its earli-

est territorial days prior to its admission as a state in the year 1876, that permanent human population within its borders was dependent for existence itself upon a scientific use of its water supply and that such use must depend upon a development of legal institutions for the government, control and conservation of the water of its flowing streams throughout the state. In virtue of its sovereignty and beginning with its first legal acts as a sovereign state in that year, it adopted and has since hitherto developed and carried out an express policy of state ownership, jurisdiction, control and administration of all the waters of the state, including particularly the waters of the Arkansas River and its tributaries. Beginning with the year 1876, and steadily since that time, the State, by reason of its necessities, has progressed with its development of this doctrine to a greater degree than any other state in the Union, and today and from its admission to the Union, the State, by its Constitution and laws, has treated all of the flowing water in the state as the property of the state itself, permitting its citizens to acquire only usufructuary rights subordinate to the state ownership, given for the time being to private agencies but subject and subservient always to the dominant will of the State. The State has through an elaborate and ever-improving code of laws and a great series of administrative officials controlled and administered during every hour and in every detail the diversion and use of waters from the Arkansas River and its tributaries. State officials, acting under a voluminous code of laws, enacted to meet the peculiar necessities of its territory, control, inspect, forbid and permit the construction of reservoirs, dams, head-gates, and all other devices for the diversion and use of water, measure and rate the same, and by daily and hourly direction distribute all of the waters of the Arkansas River pursuant to claims which must first be established by judicial proceedings conducted at State expense. The State of Colorado is responsible for and assumes responsibility in its sovereign capacity for the use, diversion

and disposition of the waters of the Arkansas River and its tributaries. It has by numerous acts of law and policy, supported by the interpretations of its courts, claimed the right to use within its borders and to distribute all of the waters originating and flowing therein to such of its citizens and inhabitants as it chose to select, without regard to the claims of the inhabitants or citizens of any other state, including the State of Kansas, and subject only to such limitations as this Honorable Court might determine to exist between this State as a whole and other sovereign states as a whole, or such compacts and agreements, if any, as might be entered into by this State as a whole and in its sovereign capacity with other states as a whole and in their sovereign capacities, with consent of the Congress.

SIXTH

By the Constitution of Colorado, adopted in 1876 and still remaining the law of the State, it is provided by Article XVI, Section 5, as follows:

> "The water of every natural stream, not heretofore appropriated, within the State of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided."

By Section 7 of Article XVI the use of water is declared to be *publici juris*, and the right of eminent domain granted therefor, as follows:

> "All persons and corporations shall have a right-of-way across public, private and corporate lands for the construction of ditches, canals and flumes for the purpose of conveying water for domestic purposes, for the irrigation of agricultural lands, for mining and manufacturing purposes, and for drainage, upon payment of just compensation."

These provisions have been frequently interpreted by the courts of the State as declaratory of the public policy that the waters of the streams of the State belong to and are controlled and properly administered by the State in its sovereign capacity as a matter of public and governmental activity. Thus, in the case of *Stockman vs. Leddy*, 55 Colorado Reports 24, in 1912, the Supreme Court of Colorado, in upholding legislative acts appropriating public money for the protection and defense of its sovereignty in the natural streams, said (p. 29):

> "The entire volume of these streams is therefore made up of rains and snows that fall upon the surface of lands included within the exterior lines of this state and of springs which issue from the earth within the same area. Such being the peculiar conditions, the state was justified in asserting its ownership of all the natural streams within its boundaries. When Colorado was admitted into the Union with such a constitution, the federal government, through its law-making and executive departments, thereby recognized and confirmed such right of ownership as belonging to the state in its sovereign capacity. We therefore find it to be not only that our state constitution and pertinent statutes, but the decisions of the courts and duly announced public policy, all are in accord on the proposition to which the federal government has, as we have just shown, given its consent that the waters of the natural streams of this state belong to the people, to the state, in its sovereign capacity, and that its right to their distribution and control within its borders is free from any interference by any other sovereignty. * * * * We find nothing in United States v. Rio Grande Irrigation Co., 174 U. S. 690, 19 Sup. Ct. 770, 43 L. Ed. 1136, Kansas v. Colorado, 206 U. S. 46, 27 Sup. Ct. 655, 51 L. Ed. 956, Rickey L. & C. Co. v. Miller & Lux, 218 U. S. 258, 31 Sup. Ct. 11, 54 L. Ed. 1032, Bean v. Morris, 221 U. S. 485, 31 Sup. Ct.

703, 55 L. Ed. 821, or in any other case that has been brought to our attention, which militates against our conclusion, when these cases are considered, as they should be, in connection with the facts on which they were determined."

By other legislation the state has likewise forbidden the recognition of any private claims for the use of water arising within Colorado, for irrigation or other purposes, outside the state and has assumed responsibility in its sovereign capacity for such obligations, if any, as the state bore to other sovereignties, recognizing alone the procedure provided by the Constitution of the United States for the settlement of any supposed claims against the State of Colorado by compact between states or by the determination of the Supreme Court of the United States upon the petition of another sovereign power. Accordingly at practically every session of the legislature for a decade past public moneys have been appropriated for the defense of the state's sovereign rights in its streams.

By a legislative act of 1917 (Session Laws, 1917, p. 539, Sections 1 and 2; Compiled Laws, 1921, Sections 1618 and 1619) the State expressly forbade "any person, corporation or association to divert, carry or transport by ditches, canals, pipes, conduits, natural streams or water courses, the waters of any springs, reservoir, lake, pond, creek, river, stream or water course of this state into any other state for use therein"; recited the policy of the State towards a unit control of its water resources and instructed its administrative officials entrusted with the diversion and supervision of water to prevent the use of its waters in any other state, and directed its Attorney General, by suit, to cause the courts to enjoin any such attempted assertion within this state of the right to use its waters outside of the state. This statute was an adoption by Colorado of the Act of the State of New Jersey (New Jersey Laws of 1905, chapter 238, p. 461), theretofore construed

and considered by the Court of Errors and Appeals of New Jersey (70 New Jersey Equity, 695) and considered and upheld by this Honorable Supreme Court in a cause entitled *Hudson Water Co. vs. McCarter* (209 United States 349), and its adoption by Colorado carried into the laws of Colorado the judicial construction and adjudication that the act was a valid, proper and constitutional act and expression of policy by a sovereign state. Pursuant to the same policy the courts of Colorado have declared that the special statutory proceedings, whereby the rights of private claimants to the usufruct in waters of streams are determined and whereby the administrative officials controlling diversions are given instructions to recognize priorities by distribution, forbid by the rules of public policy the recognition by the courts or administrative officials of any claims to or use of water outside the boundaries of the state. Thus as early as 1900 the Supreme Court of Colorado, in a case entitled, *Lamson et al. vs. Vailes et al.*, 27 Colorado Reports 201, held that the owners of an irrigation ditch which was so constructed as to divert water from the La Plata River within the State of Colorado near the state boundary between Colorado and New Mexico, who thus proposed to carry the water so diverted across the state line for the irrigation of lands in New Mexico, were not entitled to recognition by the courts of Colorado administering the special adjudication proceedings on the basis of which the water officials distributed the water in the natural streams of the state, and could not procure a decree entitling them to recognition by and participation in the administrative machinery of the state. The inevitable consequence of this ruling was to require the appropriators claiming the right to divert water under the said ditch to secure recognition, if at all, through the action, motion and rights of the sovereign State of New Mexico, the individual claimants being mere beneficiaries of such quantum of water, if any, as might be allocated to New Mexico by equitable consideration of the relative rights of the two sovereign states

in respect to the La Plata River. The said claimants remained without recognition until a compact was in the year 1923 d. v and with consent of the Congress entered into by the sov· ign states of Colorado and New Mexico providing for the ·posal of the waters of the La Plata River.

Be ing with the year 1879, by an elaborate series of statutes ·e State has developed a procedure for the examination, investigation and determination of the usufructuary rights of all public corporations, public and private institutions, and private individuals in the natural streams of the state whereby, from time to time, at the expense of the public, certain courts, in a proceeding originated in Colorado, and *sui generis,* review and announce the various claims which are entitled to recognition by the water officials of the state in the distribution of water. (Compiled Laws of Colorado, 1921, Chapter 35, Part VIII, Sections 1752 to 1802.) These proceedings result in decrees which are transmitted to the numerous officers charged with the administration of the streams, and the officers are forbidden to distribute water to any claimant whose rights shall not have been so determined and recognized. (Compiled Laws, Colorado, 1921, Sections 1762, 1767, 1784, 1788 and 1798.) By a further series of acts a state engineer is established who "shall have general supervisory control over the public waters of the state" (Compiled Laws, 1921, Section 1804), and who is given supervision over the subordinate division engineers and water commissioners. (Compiled Laws, 1921, Section 1807.) The State is divided into six water divisions of which the Arkansas River and its tributaries constitute substantially Division No. 2 (Compiled Laws, 1921, Section 1823), and a division engineer (Compiled Laws, 1921, Sections 1830, 1832) is given general jurisdiction to execute the distribution of water in his respective division. Next subordinate to the division engineer are water commissioners (Compiled Laws, 1921, Section 1838), each with a district assigned to him, whose duty it is to direc ·nd control in every detail the

opening and closing of all the headgates in his district. The area supplied by the Arkansas River, by these and other statutes (Chapter 35, Compiled Laws, 1921) is divided into twelve districts, being Districts Nos. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 23 and 67, in each one of which a water commissioner, under the supervision of the division engineer and in turn of the state engineer, each day permits, forbids and/or regulates all diversions of water for agricultural, domestic, municipal, manufacturing or other uses, according to the stage of the stream, the relative demands for water, and the several recognized appropriations certified to him by the courts. No person desiring water can divert the same except, if, as and when authorized by the Water Commissioner, and in both theory and practice no water is diverted except by the order and direction of the public officials in control of the stream. The remedy provided for a person aggrieved by the acts of a commissioner is an appeal through administrative channels from the commissioner to the Division Engineer and in turn from him to the State Engineer and, if necessary, the courts. In theory and practice the whole series of administrative officers are in hourly contact by telephone and similar methods with all persons diverting water, and know from hour to hour by means of reports and automatic recording registers on the streams and headgates the immediate operating conditions and stream flow. This system, originating in the peculiar necessity of the State, has been developed through innumerable steps of statutory enactment, repeal and amendment at every meeting of the General Assembly of Colorado since 1876, and by innumerable administrative regulations, devices, experiments and experiences. It is still in a state of evolution and improvement, and is and will continue to be a developing policy, art and science.

SEVENTH

Under said system of ownership and control of the streams by the State in its sovereign capacity the Arkansas

River and its tributaries for a distance of more than 250 miles on the main stream and an additional aggregate of at least 250 miles on its tributaries in Colorado is continuously operated throughout the year under a complex, complicated and unbroken single system and as a single unit. The waters are divided between irrigation, domestic, manufacturing, and other uses by state officials who recognize no priorities or claims to priority except those officially listed and adjudicated as to relative time of appropriation, amounts of appropriation, uses, and location of headgates, all applied to the stage of the river, climatic conditions such as recent rains, consideration of the varying demands for crops, and the stage of the river flow. More than four thousand separate usufructuary rights are recognized and administered on the Arkansas River and its tributaries. The priorities are numbered in consecutive order within each water district, and the water districts are in turn consolidated into a single list of priorities applicable to the whole river, and diversions are permitted or forbidden, in whole or in part, from hour to hour, on the basis of a vast mass of governmental experience and contemporaneous observation throughout the drainage area of the Arkansas River. Numbers of ditches have acquired (in the process of bringing about a more economic use of the water) by consolidation and purchase, authorized by the courts of the state under principles of sound public policy, more than one and frequently a considerable number of different usufructuary rights, varying in date and quantity and available at varying times and in varying amounts under the complex system of governmental control. Every usufructuary right is limited in quantity to the necessities of the place and time and by considerations of economic utilization, and the right to divert water depends upon an immediate and intimate knowledge of time and place of use at and during every occasion that water is diverted, and requires the constant exercise of human discretion. Moreover, upon discontinuance of use,

the usufructuary privilege vanishes on principles of abandonment, and under special proceedings provided therefor the right is cancelled on consideration of the special facts surrounding it, and the amount of water formerly diverted reverts to the common fund of the sovereign. Alterations in place of diversion, use, time or quantity are permitted only after special judicial proceedings in the courts of the state whereby, if the public policy and the interest of the state (the State being always a party thereto) permit, instructions are given the administrative officers to recognize such changes in the relations of the parties entitled to their consideration. Under this process a uniform use, with a maximum economy and consideration of the public welfare, is maintained, and any interruption of the process would effect the utmost confusion, come into collision with many express provisions of the laws of this sovereign state, and produce the most serious public consequences throughout the great drainage area of the Arkansas River and disaster to the general welfare of the citizens and inhabitants of this state. The claims of the sovereign State of Kansas, if any she has, should and must be asserted by such sovereign state as such against the sovereign State of Colorado as such, and any determination that any irrigator or other claimant in Kansas should be entitled to an adjudication and determination of some supposed individual claim against an individual appropriator or individual appropriators in Colorado would result in the destruction of the governmental system maintained by your complainant, would run into collision with numerous express statutory provisions binding upon the officials of the State of Colorado, would disrupt the whole governmental system, and would be impossible of intelligent or even lawful administration and would perhaps produce public disorder. The propriety, political wisdom and economic necessity of maintaining and dealing with state rights in the interstate streams as a whole between the states only is recognized not only by the decisions of this Honorable Court in dealing with the con-

troversy between Kansas and Colorado hereinafter referred to, but also the controversy between Wyoming and Colorado recently before this Court, and also by the fact that the Western States affected by this problem (though none so acutely as Colorado) have by numerous compacts such as those between Colorado and Nebraska in regard to the South Platte River, between Colorado and New Mexico in regard to the La Plata River, and the pending compacts between the seven states regarding the Colorado River now undergoing laborious negotiation, determined to treat the states as units and on no other basis for the equitable allocation of the benefits of the natural resources which are common to them. There are likewise compacts in process of negotiation between Colorado, Nebraska and Wyoming on the North Platte River, Colorado and New Mexico on the Rio Grande, between various states on the Columbia River and (as hereinafter set forth) between Colorado and Kansas regarding the waters of the Arkansas River.

The recognition of the fundamental principles of ownership, control and administration of the waters of the streams by the States in their sovereign capacities, in conformity with local necessities, and for the general welfare of each of the States, and with administrative rules and statutes varying according to such local necessities and responsive only to the sovereign will of the States in which the use of the natural element is essential to the very existence of the State and its people, and free from claims of foreign servitude save only such as may be fixed by compacts between the states or by decision of this Honorable Court in suits between the sovereign states, not only comports with the fundamental principles of our Federal union of states equal in powers and in all other respects, but likewise comports with human experience in securing the maximum benefits from the use of this fleeting natural element as typified in the experience in the State of Colorado with its local administrative system. The principles of local government which are inherent in all American

theory and practice, and the principles of local administration, are typified in the development of water administration thus evolved by a long series of practical experiments. There are immense geographical variances in location between individual users of water in Kansas and many of the principal individual priorities in Colorado, between whom a conflict might be conveniently sought, amounting to a difference between them of hundreds of miles of river channel in isolated mountain gorges or on the open prairie. The administration of relative usufructuary rights involves the consideration also of the fact that the water flows through different climatic zones subject to varying conditions of rainfall, heat and loss of water under meteorological occasions which vary both the need for water and the actual supply of water available from day to day and from hour to hour. Such factors render imperative the settlement of these matters between sovereign states and not between individuals.

EIGHTH

On or about May 20, 1901, upon leave of court, the sovereign State of Kansas filed in this Honorable Court an original bill of complaint in equity against the State of Colorado whereby it sought, in its sovereign capacity as *parens patriæ* of its citizens and inhabitants using the waters of the Arkansas River for irrigation and other purposes, to prevent the State of Colorado, in its sovereign capacity and as *parens patriæ* and representative of all its citizens and inhabitants also, from permitting the diversion and use of the waters of the Arkansas River and its tributaries within the State of Colorado and thereby in any respect depleting, diminishing or affecting the flow of the Arkansas River as it had always flowed into and across the State of Kansas. The State of Colorado duly appeared in said action, and by demurrer and answer set up in turn, among other things, its claim to use as it saw fit for the benefit of its citizens and inhabitants and in its sovereign capacity all of the

waters of the state even to the complete exhaustion thereof and the prevention of any of the same escaping into Kansas. Thereafter the State of Kansas, by amended bill, made parties defendant to the said action along with the State of Colorado certain important corporations engaged in the diversion and use of the waters of the Arkansas River for agricultural and manufacturing purposes, namely, the following corporations: The Bessemer Ditch Company, The Oxford Farmers Ditch Company, The Otero Canal Company, The Lake Canal Company, The Riverside Ditch Company, The Catlin Consolidated Canal Company, The Graham Ditch Company, The Lamar Land and Canal Company, The Amity Canal and Reservoir Company, The Rocky Ford Canal, Reservoir, Land, Loan & Trust Company, The Fort Lyon Canal Company, The Colorado Land & Canal Company, The Great Plains Water Company, The Arkansas Valley Sugar Beet and Irrigated Land Company, The Colorado Fuel & Iron Company, and The Bent-Otero Improvement Company. The said companies included most of the largest users of water, particularly for agricultural purposes, from the Arkansas River in Colorado, and the greater number of them appeared, pleaded, and participated in the proceedings. The United States, by leave of court, filed its petition of intervention setting up a claim of national title to and right of control of the waters in non-navigable streams of the western states and thereafter submitted proof and participated in final argument and disposition of the case, but this Honorable Supreme Court held adversely to the United States and confirmed the rights of the States to full jurisdiction over their streams. The said cause coming to issue after various proceedings, and after the recording of vast amounts of testimony at great expense and labor to all the parties, this Honorable Court, in a notable decision and determination, duly made and entered May 13, 1907, duly held, adjudicated and decreed among other things that it had jurisdiction to consider and determine the question of the relative exercise of the sovereignties of the

states of Kansas and Colorado upon the waters of the Arkansas River and its tributaries; that the states could and did in their sovereign capacities and as *parens patriae* of the citizens, inhabitants, and the interests and welfare of their population, represent and speak for the great number of persons and institutions in the respective states using the waters of the said river for beneficial purposes, and that the matters should be determined between the two states as a whole on the basis of their respective benefits in the said stream, their requirements and relative dependence thereon in view of climatic, geographical and other conditions, and the equitable principles governing the asserting of both sovereignties on the water flowing therein. The Court heard and examined the issues which were duly made up and presented to it regarding the whole history of the diversion and use of the said stream for irrigation, domestic, manufacturing and other beneficial uses, considered as part of the cause and litigation the actual past and present diversions and other uses of the stream by all persons and parties under the protection of either state, including the rights, claims and acts of all claimants to water in both states to the date of the close of testimony therein, to wit: on or about May, 1907, and judicially determined that the State of Kansas was not entitled to have the waters of the Arkansas River flow as it was always accustomed to prior to the advent of man into and through the territory now known as the State of Kansas; that there might be on the other hand equitable limitations on the sovereign right of the State of Colorado to wholly exhaust the waters flowing in the channel of the said river so as to prevent any of the quantity whatsoever entering the State of Kansas from the State of Colorado, but that to the date last above mentioned, in respect to which testimony was offered by the two states, the diversions and use of the waters in the State of Colorado did not exceed and had not exceeded the lawful exercise of the sovereignty of Colorado upon the water of the said river under the principles of equity and international

law held applicable to the controversy. The Court therefore dismissed the bill of the State of Kansas against all of the defendants "without prejudice to the right of the plaintiff (the sovereign State of Kansas) to institute new proceedings whenever it shall appear that through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river." It was thereby duly adjudicated that the quantum of water represented by the appropriations and diversions existing and carried on within the State of Colorado under its authority in the year 1907 was within the lawful rights of the state, its corporations and citizens, and the continuance of such appropriations and diversions was in legal effect quieted to the State of Colorado, its corporations and citizens. The records and proceedings of the said cause are, for brevity by reference, respectfully made a part of this Bill of Complaint, including particularly the decision of the Court reported under the name of *Kansas vs. Colorado*, in 185 United States Reports, 125 and 206 United States Reports, 46.

NINTH

In reliance on said adjudication and determination the State of Colorado and its citizens have continued the diversion and use of the waters of the Arkansas River to the extent that the same existed and were in actual use at the dates included within the issues and testimony in the above mentioned cause. Complainant respectfully submits that no material increase has been made in the depletions of the waters of the river, and that the substantial interests of the State of Kansas have not been detrimentally altered or the equitable apportionment of benefits disturbed since the said date. Such changes, if any, as have occurred are utterly immaterial, and are brought about by the natural alteration in geographical conditions incident to the passage of time only.

and at the date of this complaint the waters flowing into the State of Kansas vastly exceed the quantity to which the State of Kansas for itself, its citizens and inhabitants, is entitled, under any doctrine of equitable apportionment of the benefits of the stream as between states. In reliance on the said adjudication and determination, however, the State of Colorado, without materially altering the quantity of water available within the State of Kansas, by the better governmental regulation and conservation of the water, by the enterprise of various individuals, aided by improvement in the arts and the more settled conditions in Colorado, has not only maintained but materially increased the welfare, happiness and prosperity of its citizens immediately dependent upon the said river and also its citizens at large, and its institutions, settlements, and public and private industries and enterprises throughout the valley have until recently become more permanent, more contented, and more firmly established.

TENTH

The taxable value of lands and property dependent upon the drainage of the Arkansas River has substantially increased since the year 1907, and there have been substantial additions to school, municipal, state, and other governmental or semi-governmental properties, all based upon the proper and lawful reliance of the State of Colorado, its officers, citizens and inhabitants on the adjudication of this Court that until the State of Kansas as accepted spokesman for itself, its citizens and inhabitants, undertakes to invoke the further activity of this Court in the premises, the status quo and the further economic use of the waters in the Arkansas River, in pursuance of the principles laid down in the above mentioned litigation, would prevail, and could be depended upon as the basis of the development and civilization of the Arkansas Valley and Colorado. Relying also upon the doctrine of the foregoing decision to the effect that the relative claims of the two states and the citizens and inhabitants

thereof were fixed and determined forever as between the two states as units and were to be thereafter adjudicated and determined as a whole between the two states, and that the distribution within the two states of the benefits of the said river was and would continue to be a matter of internal administration within the limits of each, the State of Colorado, by the expenditure of great sums, labor and investigation, has extended and improved its machinery and laws for the distribution of water within the State of Colorado, and annually has expended and now continues to expend large sums of public money in developing the whole system as a single unit throughout the river and its tributaries, in the belief that the principles upon which the same were established would be maintained and protected. Since the above mentioned decision the State of Kansas has not invoked or sought to invoke the action of this Court in the premises.

ELEVENTH

In spite of the foregoing adjudication, citizens of the State of Kansas, in defiance of the adjudications above recited, and in defiance of the principles of law above set forth, have, since said decree, commenced, and do continue and now threaten to carry on the litigation of their relative private claims to the waters of the Arkansas River before the District Court of the United States for the District of Colorado. Individual citizens and corporations claiming under the laws of Kansas, asserting ownership of canals and claims to water all of which were fully presented, considered and determined in the above recited litigation between Kansas and Colorado, have continued to litigate with and annoy citizens of the State of Colorado without consulting the interests of either state as a whole, and without making parties thereto or in any way bringing before the courts the State of Kansas or the State of Colorado, and in utter disregard of the adjudication above mentioned and the principles there arrived at. Individual corporations and citizens of Colorado have been

and are now being sued by such citizens of the State of Kansas in the United States District Court for the District of Colorado to enjoin the use of water by said defendants, though such use is authorized, administered and regulated by the State of Colorado, justified by it and claimed by it as a lawful part and derivative of the rights heretofore quieted and adjudicated to Colorado by this Court. Said defendant inhabitants have protested and objected thereto in the United States District Court, have constantly alleged that the matter was one as between the states from which the parties derived their respective rights, that the United States District Court had no jurisdiction in view of the action and determination of this Honorable Court, and that any attempted adjudication of the rights and acts of individual parties was beyond the jurisdiction of the lower courts, and no determination of their respective claims could be arrived at without the participation of the State of Colorado and the State of Kansas as such. The defendants in such cases have also urged what your complainant respectfully submits is the unquestioned fact that, in view of the determinations and actions of this Court, any attempt to adjudicate and put limits upon the rights of individual citizens of the two states could only produce confusion and uncertainty and disorder; that it was impracticable, if the states as a whole were entitled to certain relative benefits, to adjudicate as between the derivative benefits of the citizens thereof without affecting the whole and thereby adjudging the rights and duties of the states in the absence of both; that to permit such litigation was to recognize a right in private citizens of one state to assert and impose a servitude upon the territory and streams of a neighboring state without its consent and to recognize private claims as independent of and superior to the rights of either state; that the Supreme Court had taken and retained jurisdiction over the controversy at the election and request of the sovereign states involved, and no other court had authority or jurisdiction to affect, diminish or dis-

turb the balance of the rights of the said states except this Court, which alone had jurisdiction of the sovereign states involved.

TWELFTH

In spite of such protests by the individuals so sued, represented by motions to dismiss, special answers, and by other proper means, the plaintiffs in said causes have insisted on continuing litigation in the said United States District Court, and the said Court has overruled all protests and has asserted its right to consider and adjudicate such complaints, and the plaintiffs continue to press and now threaten to further press, and will, unless enjoined, further press, and the said court will entertain, their prayers for the adjudication of their rights as between private individuals in both states. The following account of the cases brought by individuals against individuals in Colorado is respectfully presented as showing the history and status of this unlawful and confusing private litigation, to wit:

(a) On or about August 27, 1910, the United States Irrigating Company, a corporation of Kansas (asserting the ownership of two certain irrigation ditches near Garden City, Kansas, the claims, acts and history of which had been fully presented, urged, recited, testified to and adjudicated in the above mentioned litigation in this Honorable Court between the State of Kansas and the State of Colorado), brought suit in the United States District Court for the District of Colorado against The Graham Ditch Company, The Fort Bent Canal Company, The Lamar Canal and Irrigation Company, The Fort Lyon Canal Company, The Oxford Farmers Ditch Company, The Rocky Ford Canal, Reservoir, Land, Loan & Trust Company, The Reorganized Catlin Consolidated Canal Company, The Rocky Ford Ditch Company, The X Y Irrigating Ditch Company, The Manvel Water Company, The Twin Lakes Land & Water Company, The Twin Lakes Reservoir Company, The Canon City, Florence & Pueblo Water Company, The Bessemer Irrigating Ditch Company

The Holbrook Irrigation District, The Otero Irrigation District, The Arkansas Valley Sugar Beet and Irrigated Land Company, and The Colorado Southern Irrigation Company. It alleged in said suit that the plaintiff owned a priority and right of appropriation in Kansas said to have been acquired in 1881 for 250 cubic feet of water per second of time from the Arkansas River for the Great Eastern Ditch, said to have been continuously operated under said priority in said time and amount from that date to the date of suit, and the plaintiff also claimed a priority or right of appropriation initiated in the year 1880 in the amount of 100 cubic feet per second for the South Side Ditch, both ditches being alleged to be in Finney and Kearney counties, Kansas. It sought to have the defendants enjoined from diverting water under their various ditches and structures for irrigating and manufacturing use in the State of Colorado, alleging that the supposed priorities and rights of appropriation of the defendants were junior in time to those of the plaintiff, claiming the right to have said alleged superiority of appropriation enforced without regard to state boundaries or to the policies of the said states, and alleging also that Colorado had exceeded its equitable and relative rights in the flow of the river as determined between the sovereign states of Kansas and Colorado. The plaintiff also joined as parties numerous water officials of the State of Colorado, to wit: the then State Engineer, Division Engineer for Water Division No. 2, and the Water Commissioners of various districts. The court dismissed the bill as to the water officials joined as defendants, over the resistance of the plaintiff but upon the plea of the said governmental officers that suit against them constituted a suit against the State of Colorado in view of the laws, policy and system of the State of Colorado and the ownership of the water of the natural streams by said State. The court permitted the suit to proceed against the other defendants alone, in spite of the fact that it is the settled practice, procedure and law of the State of Colorado that the water officials must

be joined as defendants in any suit affecting relative priorities or the diversion and use of the waters of the streams of the State of Colorado. The plaintiff incidentally, apparently anticipating a plea of laches, pleaded the litigation and conclusion of the case between Kansas and Colorado above described, and thus it appeared in the complaint itself that all of the defendants (except two) had been operating through themselves or their predecessors in interest the same irrigation enterprises and claiming the same rights prior to the litigation between Kansas and Colorado, and that their rights, acts, diversions and history had been fully presented in the case of *Kansas vs. Colorado.* (The two individual defendants excepted above represented new enterprises which were not then completed and have since remained uncompleted, and the said two defendants have no rights to divert water in the State of Colorado, and never have had.) Substantially all the defendants named in the complaint had, either in their own persons or through direct predecessors in interest which then owned the same enterprises and irrigation structures and appropriation rights, been actually named as individual defendants, and impleaded as such by the State of Kansas in the above described litigation in this Honorable Court between the State of Kansas and the State of Colorado. Before the above mentioned cause, however, reached final conclusion but after the expenditure by the individual defendants of large sums of money for the preparation of evidence and the presentation of pleadings and preliminary matters, the said cause was dismissed by the complainant at its own costs. The State of Colorado was not a party to the said cause of action, and would not have consented to the jurisdiction of the United States District Court over itself, nor was the State of Kansas in any respect a party thereto, yet under the pleadings as presented, the Court, over the objection of the defendants, assumed the right to determine the relative rights of the sovereign State of Colorado and the sovereign State of Kansas in the waters of

the Arkansas River. The State of Colorado took no part in the negotiations leading to the settlement of the said cause, but is informed and believes that the individual defendants, despairing of avoiding expensive litigation involving the whole history of the settlement of the Arkansas Valley, bought the dismissal of the case by the payment of a money consideration to said plaintiff.

(b) Thereafter The Finney County Water Users' Association, a corporation of Kansas, (defendant in this present cause before this Honorable Court), on or about November 27, 1916, filed a bill of complaint in equity in the United States District Court for the District of Colorado against the same parties named and recited as defendants above in the suit by the United States Irrigating Company against The Graham Ditch Company and others, the said plaintiff apparently has been encouraged and led thereto by the success of the United States Irrigating Company in maintaining its bill through the preliminary stages in said court and its success in obtaining whatever monetary compensation it received, if any. The rights asserted by said plaintiff had, as in the case last recited, all been pleaded, considered and adjudicated by this Honorable Court in the above mentioned original litigation between Kansas and Colorado. The bill of complaint, except as respects the special allegations affecting the plaintiff's own priority and its own history and position, was substantially a verbatim copy of the bill of complaint filed by the United States Irrigating Company, and contained the same general allegations and stated the same pretended cause of action against the same defendants, alleging, however, that the plaintiff was the owner of the so-called "Farmers Ditch" and alleging that it owned a priority or right of appropriation for 250 cubic feet per second from the Arkansas River, initiated and dating from 1880, as it alleged, which priority had been owned and exercised in that form from that date to the date of the filing of its bill of complaint. By reason of errors in the said bill of complaint in respect to

the defendants alleged and events which had occurred since the filing of the bill which it had blindly copied, such as abandonment of irrigation projects and the reorganization of others, the list of defendants named was modified, after the suit was filed and the defendants now complained of and parties to the said bill are as follows, to wit: The Graham Ditch Company, The Fort Bent Ditch Company, The Lamar Canal and Irrigation Company, The Fort Lyon Canal Company, The Oxford Farmers Ditch Company; The Rocky Ford Canal, Reservoir, Land, Loan & Trust Company, The Reorganized Catlin Consolidated Canal Company, The Rocky Ford Ditch Company, The X Y Irrigating Ditch Company, The Manvel Canal and Irrigation Company, The Twin Lakes Reservoir and Canal Company, The Bessemer Irrigating Ditch Company, The Holbrook Irrigation District, The Otero Irrigation District, and The Arkansas Valley Sugar Beet and Irrigated Land Company. All of the above named defendants are private corporations engaged in the diversion of water for agricultural and domestic purposes at various points in Colorado except the Holbrook Irrigation District and the Otero Irrigation District, which are municipal corporations organized under the laws of the State of Colorado to own and operate structures for the diversion and use principally of irrigating water. All of the said defendants without exception either themselves or through predecessors in interest representing the same irrigation structures, rights and priorities, were included among the individual defendants impleaded by the State of Kansas in the above mentioned litigation in this Honorable Court between the sovereign State of Kansas and the sovereign State of Colorado; and the rights, history, acts and appropriations of the said plaintiff and also of all of the said defendants were involved in, presented, litigated, considered and determined in the course of the above mentioned original litigation between the states of Kansas and Colorado, and the consequences of the acts, diversions and claims of both were fully presented, in-

volved and litigated in the above mentioned controversy wherein the states of Kansas and Colorado in their sovereign capacities appeared for and represented the acts and rights of their citizens as a whole, respectively. Notwithstanding these facts, which fully appear of record in the said cause, and notwithstanding the protest and objections of all of the said defendants against the jurisdiction of the court and the allegations of *res adjudicata* and the contention that the said cause had been determined in the case of *Kansas vs. Colorado,* and was and must be in any case essentially a suit between states, the said objections being presented by motions to dismiss and other pleadings, as well as by answer, the said court has required the said defendants to answer, is about to require the said defendants to present testimony in support of their claims, and has announced its intention to determine the relative rights of the said individuals without the presence of either state or any representative thereof, and to determine what are the limits of the equitable benefits of the sovereign State of Colorado on the Arkansas River as between the State of Kansas and the State of Colorado, all in the absence of either sovereign state. The State of Kansas has not sought or asserted any rights in said court, and the State of Colorado has not thought it consistent with its welfare or dignity to submit itself to the jurisdiction of the said court, or submit to any suit by a corporation of Kansas. The corporation plaintiff therein (named as defendant herein) will, unless prevented by this Honorable Court, proceed to litigate in the said court the rights and claims of this sovereign State of Colorado.

(c) After filing the above mentioned cause and during the pendency thereof the said The Finney County Water Users' Association (defendant in this present cause before this Honorable Court), on or about January 23, 1923, filed a second bill of complaint in equity in the United States District Court for the District of Colorado against The Coler Ditch and Reservoir Company, a corporation of Colorado,

and others, in which cause the said plaintiff named as defendants about 150 citizens and inhabitants and corporations of the State of Colorado alleged to be diverting and appropriating water from the Arkansas River and its tributaries. No reason appears for the selection of the particular defendants sued from among the many thousands of corporations, citizens and inhabitants of Colorado who appear to be equally concerned with those sued in the diversions and use of the waters of the Arkansas River authorized and legitimatized by the laws of the sovereign State of Colorado. Many of the said defendants so sued have no interest in the actual diversion and application to beneficial use of the waters of the stream and, on the other hand, several of the defendants named were made parties defendant also to the above suit and litigation described in (b) above. About 120 of the said defendants have appeared and filed various pleadings in response to the said complaint. Your complainant is unable to determine any system or theory on which the defendants so sued were selected, and the pleadings indicate that the said defendants who have appeared own or have partial or fractional interests in scattered priorities recognized in the State of Colorado for agricultural, domestic, municipal, manufacturing, and other uses, of every variety of date and amount on the Arkansas River and its tributaries from the earliest settlement of the state in the year 1861, and in every decade from that date until recent years. The defendants include the Town of La Veta, a municipal corporation existing under the laws of the sovereign State of Colorado, the Town of Walsenburg, Colorado, a similar municipal agency, and the City of Trinidad, a similar municipal agency, and the Holbrook Irrigation District, a municipal corporation, organized for the ownership and operation of irrigation usufructuary rights and property pursuant to the laws of the State of Colorado, and the Highland Irrigation District, a similar irrigation corporation. A great number of other towns and cities owning and operating appropriations and

facilities for the diversion and use of water from the Arkansas River and its tributaries similar to those sued and both earlier and later in time and greater or less or similar in quantity, and in all respects similarly situated and similarly recognized under the system of governmental distribution of water from the said rivers carried on by the State of Colorado, are not made parties or in any way complained against. There are other municipal irrigation district corporations in the state similar to those named as defendants who are not in any respect impleaded in said cause or complaint. The defendants so selected, like those in the case described in (b) above, are widely scattered geographically, some of them being interested in priorities relatively separated by hundreds of miles of river, prairie and mountain ranges, all of them so located that there are between their points of diversion and the Kansas state boundary numerous persons and corporations not sued or complained of who divert water under every variety of right, senior and junior in time to those sued, and larger and greater in quantity. Most of the defendants sued are interested in priorities separated by hundreds of miles of main and tributary river channels from the State of Kansas and the plaintiff The Finney County Water Users' Association. There are also ditches in Kansas senior in construction to the plaintiff itself and located between it and the Colorado boundary which certainly assert equal or better claims, but which are not made parties, although they claim any water allowed or required to flow into Kansas, and would seize the same. The complaint of the plaintiff (except as respects the allegations which describe the rights and claims of numerous defendants) is a verbatim copy of the complaint filed in the case of The Finney County Water Users' Association and others against The Graham Ditch Company and others described in (b) above, and alleges that the plaintiff asserts the same priority as there alleged to belong to The Farmers Ditch in Kansas, and seeks relief on the same grounds and upon the same allegations. On or

about October 22, 1926 the motions to dismiss filed by the defendants and similar to those filed in the earlier cases were overruled as in the previous cases, and on or about April 1st of the present year the answers of the defendants appearing were completed and filed, the court having, without an opinion but presumably for the reasons expressed in the case described in (b) above, determined to proceed with the adjudication of the supposed relative rights of priority of the private plaintiff and defendants and to determine the present extent of the diversion, uses and needs of the whole State of Colorado and of the whole State of Kansas, and the relation of the use and depletion of the river in Colorado to the equitable rights of the State of Colorado as against the State of Kansas, all without the presence of either state. Unless the said plaintiff made defendant in this Honorable Court is enjoined from the prosecution of the said action, it will, as it threatens, offer testimony, require the defendants to offer testimony, and cause to be adjudicated in the said United States District Court the relative appropriations of the said individual plaintiff and the said isolated and segregated individual defendants, and also the relative rights of the sovereign State of Colorado as a whole in the benefits of the said river as against the sovereign State of Kansas as a whole, the court having announced its determination and duty to do so in the previous opinion based on a bill of complaint identical in all material particulars.

THIRTEENTH

In the case of *The United States Irrigating Company vs. Graham Ditch Company* and others ("a" above), all of the defendants (or their predecessors in the same irrigation properties) had been made defendants in *Kansas vs. Colorado;* all of the usufructuary appropriations of the defendants attacked, and the exercise whereof was sought to be enjoined as being an interference with the claims of the plaintiff, are and were initiated, valid and effective and in full use

under the ordinary doctrine of appropriation long prior in date to the filing of the complaint in *Kansas vs. Colorado* and, of course, also long prior to the date as of which issue was made by the pleadings in *Kansas vs. Colorado* and the date as of which evidence was considered and the adjudication in *Kansas vs. Colorado* was entered. In the case of *Finney County Water Users' Association vs. Graham Ditch Company* ("b" above), the same defendants were named, and the same facts exist in respect to their appropriations, that is to say, their appropriations were made and their diversions began and continued for a long period prior to the date of the filing of the case of *Kansas vs. Colorado,* to the coming to issue by pleadings therein, and to the determination of the issues therein and the adjudication thereof, and each and all of the said appropriations were by the judgment in the case of *Kansas vs. Colorado* duly held and adjudicated to be included within the reasonable exercise of its sovereignty by the State of Colorado. In the case of *Finney County Water Users' Association vs. The Coler Ditch Company* and others ("c" above), the appropriations of the defendants which are attacked in the complaint are of various dates, both prior to the filing of the case of *Kansas vs. Colorado* and afterwards, but the greater part thereof were initiated and in actual use to the same extent as now long prior to the adjudication in the case of *Kansas vs. Colorado.*

FOURTEENTH

Any adjudication entered by the United States District Court under either of the two said pending causes must necessarily take the form, if the plaintiff recovers, of a determination that the plaintiff, being entitled to a priority of some date and in some amount in the State of Kansas, is entitled to assert the same without regard to the sovereign State of Colorado or the sovereign State of Kansas or the systems of distribution and the laws of each against certain individuals in Colorado representing a priority or priorities of some

date or dates and in some amount or amounts, and that plaintiff is entitled to enjoin defendants in Colorado who are scattered as respects time of right, nature of use, quantity of water in use, and as respects geographical location over the whole system of adjudicated rights and priori ies in the State of Colorado. Thus early appropriations whose owners or users happened to be impleaded would be enjoined from the exercise of their rights when junior users who do not happen to have been impleaded will not be bound to recognize the plaintiff's rights although inferior in claim of time to those enjoined under the laws of the State of Colorado. Thus the public ownership and administration in the State of Colorado will be utterly disrupted and destroyed, and the junior appropriators who are not impleaded will claim and be able to maintain as against The Finney County Water Users' Association or any others the right to such water as the defendants who happen to have been impleaded and enjoined may be required by order of court to permit to pass undisturbed by their gates. Thus also, as a consequence, rights to priority late in date although senior in claim because of the character of their use may be enjoined from the exercise of their use at the demand of the plaintiff in Kansas, while rights in Colorado senior in time who do not happen to be impleaded or enjoined will, though junior in claim because of the character of their use, be permitted to intercept and obtain the advantage of said water. Any court decree respecting the use of flowing water between individuals requires active and often discretionary administration, and no court could anticipate recognition or obedience of its adjudications by parties not before it, or by state officials not bound by it, and no court has available the judicial machinery in the way of officers and agents to make any such decree effective without waste of water and great injustice even if it were practicable at all. Your complainant respectfully protests against the insertion into its administrative system of a collateral officer or series of officers, marshals or commis-

sioners appointed by any court. If one decree is entered by one court, similar attempts to adjudicate will inevitably follow in other courts and between other parties, which will almost certainly arrive at different estimates and adjudications of the relative rights of the parties and the relative claims of Kansas and Colorado as a whole. Each of such courts, and each of the courts in each of several separate adjudications, will be free to appoint separate administrative officers to enforce any supposed rights of the Kansas claimants which the court may find. The development of the use of returned waters (that is, waters flowing or percolating back to the stream after irrigation use) is progressing rapidly in all of the western streams, including the Arkansas River, and this and other factors are producing geographical and economic changes from day to day which require the science of water administration to adapt itself constantly to new conditions for the public benefit. The evolution of the Colorado system of administration hereinbefore described is still in process, and any attempt by outside agencies to interfere in the details or lay down such rigid rules as court procedure requires in respect to the daily claims of individual citizens of either state will retard the development of the administrative machinery and perhaps destroy the benefits already obtained. Leaving aside the rights, policy and ownership of the State of Colorado in the waters of the state, the attempt to enforce any such individual recognition of a selected appropriator in Kansas as against a few selected appropriators in Colorado would be destructive of public order, and in many ways and instances not herein outlined would be utterly impossible of intelligent administration or obedience, and would produce the greatest waste and destruction of the water resources claimed by either state. Any adjudication or modification of the rights of a single appropriator or group of appropriators in Colorado necessarily affects, disturbs and interferes with every other appropriator and diverter of water, and disturbs and affects the whole system

of initiation, adjudication and administration of the waters of the State, and no appropriator in Colorado can be individually required to limit diversion or respect the individual rights of an appropriator in Kansas without affecting and substantially destroying the jurisdiction of the State over the administration of the waters of the river, and any such orders would necesarily contradict and interfere with the daily administration of water diversions throughout the Arkansas River, and the operation of the State officials of Colorado in their lawful daily tasks. Any determination of the rights of individual Kansas appropriators against individual Colorado appropriators alone is impossible of performance or intelligent obedience, would necessarily and immediately affect and confuse thousands of irrigation users every one of whose daily claim to water is interlaced and relative to those who might be sued and is varying every day and hour, and any court injunctions as between individuals in Kansas and those in Colorado would instantly collide with state officers of Colorado who are not and cannot be made parties, and would disrupt the administration of this sovereign state.

FIFTEENTH

Your complainant, the State of Colorado, owns and claims for itself as sovereign and also for use in connection with various public institutions, several usufructuary rights to the use of water, and also ditches, canals, and other structures for the diversion and beneficial application of water from the Arkansas River and its tributaries. The rights of the State of Colorado to divert and use water under these various claims and appropriations are, as administered, subordinate in time and priority of right to numerous claims and appropriations of private individuals on the Arkansas River and its tributaries, and are senior in date and prior in use to the claims of other individuals, and are an intrinsic part of the whole administration of the system of relative

usufructuary water rights in effect throughout the Arkansas River and its tributaries, and administered by State officials from hour to hour and from day to day as above set forth. The defendants in the above described pending litigation between a corporation of Kansas and citizens of the State of Colorado are in some cases prior and senior in claim and in some cases later and junior in claim to the usufructuary appropriations and water rights owned by the State of Colorado. The adjudication by any court which does not have jurisdiction of the State of Colorado, its officials and property, that a citizen and appropriator in Kansas as such is entitled to require the cessation and diversion at any time or to any degree by selected citizens of Colorado or within the State of Colorado would necessarily affect the relative position, usefulness and value of the water rights and appropriations held by the sovereign State of Colorado, and if any owners of rights in Colorado were by the order of any subordinate court enjoined from diverting water, they would attempt to insist upon the cessation of diversions under the appropriations and rights held by this State under the application of the whole system of administration, and thereby the State of Colorado in its own property rights on the Arkansas River would be substantially affected, the administration thereof would be confused, the diversions and use of water thereunder would be prevented or hampered, and the said water rights and large investments in State Canals, State Charitable and Penal Institutions, and various other State properties would be diminished, and perhaps destroyed, through the action of such subordinate Federal Courts, which neither have nor are able to obtain authority to act, nor are of sufficient dignity to act upon the sovereign State of Colorado. The following are some of the water rights or usufructuary appropriations from the Arkansas River in which the State of Colorado, in one or another of its sovereign activities, has property rights, and interests in the waters of the Arkansas River, and in each case anything affecting the

said rights affects the whole value and usefulness to this sovereign State of the property so devoted to a public purpose, to wit:

(a) The State of Colorado pursuant to an act passed in 1891 (Session Laws of 1891, p. 352, Sec. 1) has constructed and owns the Monument Reservoir in El Paso County, Colorado, diverting and storing water from Fountain Creek, a principal tributary of the Arkansas River, which is administered as a reservoir having a priority. The waters stored therein are distributed among appropriation owners on the stream below in the discretion of the State Water Officials.

(b) The State of Colorado pursuant to an act of 1891 (Session Laws of 1891, p. 317, Sec. 1) has constructed and owns the Boss Lake Reservoir in Chaffee County, Colorado, diverting and storing water from Cottonwood Creek, Chalk Creek, and the South Arkansas River tributaries of the Arkansas River, which is administered as having a reservoir priority. The waters stored therein are distributed to the appropriators on said streams in the discretion of the State Water Officials.

(c) In connection with the State Penitentiary at Canon City, Colorado, the State of Colorado owns and operates a farm and applies thereon water from the Arkansas River diverted through the "Canon City Hydraulic and Irrigating Ditch", and also uses for agricultural purposes water from the Arkansas River diverted through the municipal diversion system of the City of Canon City; also in connection with the Penitentiary it owns the "Canon Mill Ditch" decreed for power purposes from the Arkansas River, and in various other respects the operation of the said Penitentiary by this sovereign State is dependent upon the water supply from the Arkansas River.

(d) In connection with the State Hospital for the Insane at Pueblo, Colorado, the State of Colorado carries on considerable farming operations for the support and use of

the said institution, diverting water through the "West Pueblo Ditch" under various usufructuary rights assigned to the said ditch on the Arkansas River, with priorities of various dates from 1872 to 1883.

(e) In connection with the State Institution for the Deaf and Blind at Colorado Springs, Colorado, the State irrigates and uses for domestic purposes water diverted from tributaries of the Arkansas River through the diversion system of the City of Colorado Springs under usufructuary rights granted said city.

(f) In connection with the State Reformatory located at Buena Vista, Colorado, the State of Colorado carries on extensive farming operations by irrigation from the Arkansas River and various tributaries, and is the owner of water rights under the Maynard Ditch, the Cotton Creek Irrigation Ditch, the Helena Ditch, and the Gold Nugget Ditch, with various dates of priority, upon the ownership and use of which the conduct of the said institution in its penal, educational and reformatory activities is dependent, and the State likewise operates under lease and has the benefit as lessee of extensive water rights from the Trout Creek Ditch, the Helena Ditch, the Bray Ditch, the Harmony Ditch, the Gold Nugget Ditch, and the Fish Ditch from the Arkansas River and its tributaries, to which are assigned various priorities, of various dates from 1872 to 1882. The said operations under lease as well as those owned in fee are extensive and permanent in character, and a necessary foundation for the governmental activities of the State at said institution.

SIXTEENTH

The sovereign State of Colorado and the Sovereign State of Kansas have for some years past been negotiating and discussing a compact or agreement between the States, to be made pursuant to Article I, Section X, Paragraph 2 of the Constitution of the United States, providing for such agree-

ments, whereby the said States as such would settle permanently and for all time their respective sovereign rights in the waters of the Arkansas River and thereby the rights of all citizens and appropriators within their respective boundaries in regard to the diversion and use of the water of the Arkansas River; and pursuant to statutes passed and renewed by each of the said sovereign States, respectively, a Commissioner for the State of Colorado and a Commissioner for the State of Kansas have been meeting, discussing and drafting such proposed contract and agreement, and referring the terms of the same for consideration to the citizens and officials of both states. Cooperative means for conservation of the waters of the river are recognized by both states as possible and desirable, and there have been negotiations also for flood protection for the benefit of the States of Oklahoma and Arkansas which would involve construction in Colorado of dams for irrigation storage and flood restraint by the aid and partially for the benefit of the lower states. For any such projects the States must be free to deal as units and sovereign powers, with complete internal control of their resources. The pendency of litigation and the possibilities of judgment as between private individuals in the State of Kansas and the State of Colorado in the above mentioned causes have hampered, do hamper, and threaten to render useless, meaningless and nugatory the rights and desires of the said States to settle such matters by compact, and unless prevented by proper authority, the United States Court for the District of Colorado threatens to proceed, and will proceed to enter judgments as between individual parties, which will complicate, embarrass and render wholly or partially ineffective the above mentioned power, duty and opportunity presented by the Constitution of the United States.

SEVENTEENTH

Any private rights which may exist within the State of Kansas are derivative purely from the sovereignty of Kansas

under such policy as it may adopt in regard to the riparian doctrine now in force or such other doctrine as it may from time to time in the future develop, and any and all such rights within the State of Kansas are, as in the case of Colorado, to be allocated to such quantum of water or use as the State of Kansas may be entitled to by compact between the states or by equitable principles adjudicated by this Court in a proper proceeding. Colorado and Kansas should both be free, by virtue of their inherent sovereignty which they have surrendered neither to the Federal government nor any other power, to adapt their domestic policy by such present or altered legal doctrines or present or altered administrative machinery as the problems of developing population, changing geographical conditions and other considerations may dictate. Relying upon the determination of this Court in the above mentioned litigation between Kansas and Colorado, Colorado has made great progress in the economic application, scientific use and development of its waters, and even greater progress in the development of administrative machinery for the conservation and wise distribution of the quantum of water which it is entitled to divert from the Arkansas River. Notwithstanding the solemn determination therein entered into, citizens of the State of Kansas, by their action have placed the State of Kansas in the position of acquiescing in private litigation in which it has nothing to lose and everything to gain, the result whereof might be to set aside the effects of the said determination between the states of Kansas and Colorado and thereby to place Kansas in the position of gaining by guerrilla warfare what it is forbidden to assert openly and officially as a sovereignty, and to enable its citizens, by a favorable decision in the lower Federal courts, to lay a perpetual servitude on territory of the State of Colorado to be thereafter maintained and perpetuated without the consent of Colorado, without consideration of her dignity as a sovereign state, in total disregard of her domestic policy and system of administration, and in defi-

ance of the solemn adjudication made in the case of Kansas against Colorado in 1907. If the State of Kansas has complaints against the State of Colorado because of diversions within the State of Colorado, or the interpretation given to said adjudication by the State of Colorado, she is bound, by her election and by the express reservation of jurisdiction made by this Court in the case of Kansas against Colorado, to submit any and all such complaints to this Court and this Court only.

EIGHTEENTH

The private litigation above mentioned is being maintained and pressed in pursuance to rulings of the United States District Court in and for Colorado and the Judge thereof, and the said court will, unless prevented by this Supreme Court, proceed to hear and adjudicate the matters presented to it in the manner and on the principles prayed. The said litigation has already annoyed and harrassed and caused an expense of more than one-quarter of a million dollars to the defendant individual appropriators and users of water of the Arkansas River whose rights are derivative from and wholly dependent upon and included within the authority of the State of Colorado, and who are entitled to the fruits and benefits and the law of the case as laid down in the adjudication of Kansas against Colorado, and the defendant individuals sued have been impoverished and are now practically helpless to sustain the burden of the whole state in purely private litigation. No appeal lies as of right to this Honorable Supreme Court, as your complainant is advised, from any such litigation between private individuals, and thus the whole sovereignty of the State of Colorado in respect to the use of the waters of the Arkansas River is threatened to be adjudicated and determined by subordinate tribunals without recourse to this Honorable Court, the only tribunal rightfully empowered to determine the same. The individual defendants have exhausted their remedies before the said lower courts, and the said litigation has, by reason of the numbers

of parties involved and the extent of the issues, become a state-wide calamity, especially and vitally affecting the whole prosperity and development of cities, towns and agricultural districts constituting approximately a fourth of the area of the State of Colorado.

NINETEENTH

The ultimate prayer, object and, if successful, the effect of the continuance of the said private litigation brought by said corporation in Kansas against individuals in Colorado will be, if permitted to continue,

(a) To allow a local Federal Court to usurp the functions of this Supreme Court, to assume jurisdiction between States and of political matters, to adjudicate on the policy and sovereign rights of the State of Colorado and to entertain a suit in effect against it contrary to the Eleventh Amendment.

(b) To impose on the State of Colorado without its consent what amounts in practice to a perpetual servitude on behalf of the State of Kansas and its citizens and to enforce such foreign servitude on the territory of Colorado without authority of interstate compact or decision of this Honorable Court.

(c) To remove forcibly and forever from the sovereign State of Colorado the public ownership, control and administration of all diversions of water from the Arkansas River in Colorado to the gain of Kansas and her citizens, without the consent of the State of Colorado, in complete disregard and indifference to her constitution and laws and in defiance of her inherent rights as a sovereign State; and through the instrumentality of bailiffs or other officers appointed by the Federal District Court and responsive to the will of that court and not to the law of either State, to supersede the state executive and administrative officers and to take over the administration of diversions from the stream and its tributaries in

perpetuity, immune from state control and utterly indifferent to the will of the State and to her changing necessities.

(d) To destroy the principles and practice of local government and local administrative units, long ago woven into the fabric of American traditions and particularly suited to the conservation, use and economic application of flowing water in an arid region.

(e) To repudiate the quantum allocation of water adjudicated to Colorado in the case of *Kansas vs. Colorado* and deprive your complainant of all the peace and security which was the fruit of said cause and which should be the end of every litigation.

(f) To determine as between an inhabitant of the State of Kansas and a few inhabitants of the State of Colorado some supposed relative private usufructuary interests presumably deraigned from the State of Kansas in the waters of the Arkansas River within Colorado without either of said sovereign states being brought before any court to adjudicate the same and without either being represented or bound in the said litigation.

(g) To enjoin and overturn the long established rights and long-continued activities of Colorado defendants, which rights, activities and operations were considered by this Supreme Court in the case of *Kansas vs. Colorado* and there adjudicated to be lawful, proper, and within the limits of the authority and sovereignty of the State of Colorado, and thereby to ignore, set aside and destroy the benefits of the people of Colorado acquired by virtue of the long, expensive and laborious litigation in the case of *Kansas vs. Colorado.*

(h) To require the administrative officers of the State of Colorado concerned with the administration and supervision of water rights and diversions from the Arkansas River either (in the alternative) to refuse recognition to orders and decrees which affect the whole of the administration of the

river, though binding on only a few individuals (on the ground that the State and said officials are not parties thereto nor bound thereto, that such decrees are contrary to the policy of the State, are not contemplated by the statutes under which they operate, and are destructive of the whole system, including the rights of numerous individual parties not impleaded in the said private litigation), or else to abandon the whole system of water distribution on the Arkansas River.

(i) To announce and determine supposed relative individual usufructuary relations between water users in two states which have wholly different laws and water systems, Kansas asserting the riparian system and Colorado the appropriation doctrine.

(j) To establish, through the judicial department, a new interstate government, unknown to the Constitution, and thereby to administer without regard to the sovereign states involved, property rights created by each, properly controlled by them separately and respectively, and which are derivative from, and should be adjudicated and administered only as claims upon the fund or quantum of the water from the Arkansas River available to each State as a whole.

(k) To impose within Colorado, as the only effective means of enforcing decrees entered in any private litigation, a body of Federal marshals, commissioners or masters, or the marshals, commissioners or masters of other courts having jurisdiction of the particular persons involved, which body will usurp the functions of the state administrative officers, interfere with them and dislocate the orderly system of administration now developed and hereafter to be improved, all with the consequent results of waste of water, lack of proper supervision of conservation and economic principles, public disorder and the practical destruction of the sovereignty and jurisdiction of your complainant.

(l) To throw upon individual appropriators in Colo-

rado the burden of defending and litigating the claims of the whole State in respect to said river when they are without means, facilities or authority so to do, and thus to impoverish them.

(m) To embarass, hamper, and render nugatory the right and duty of the State of Colorado and the State of Kansas to settle, by compact between them, the relative rights of the said States and their citizens and the other appropriators and users of water within their respective boundaries, pursuant to Article I, Section X, Paragraph 2 of the Constitution of the United States, and thereby to render illusory, ineffective and nil the right, duty and desire of the said States as above set forth, to negotiate and settle any existing differences between them in the manner provided by the Constitution.

(n) To confirm in the lower Federal courts in the District of Colorado jurisdiction to consider and determine in a suit to which the State is not a party, the rights of the State of Colorado which are inherent in its sovereignty and are actually exercised and administered by its sovereignty, though such assumption of jurisdiction is in defiance of the provisions of the Constitution of the United States whereby the State of Colorado in its sovereign capacity can be impleaded only in the Supreme Court of the United States, the rights and dignity of which position the State of Colorado has never waived nor abandoned in any respect.

(o) To confuse and intermingle forever the respective jurisdictions of the State and Federal governments and also of the judicial and executive branches of both governments, and as a result thereof to hamper and perhaps destroy the orderly evolution of agriculture, industry, and human population in the Arkansas Valley.

TWENTIETH

Your complainant, the State of Colorado, offers to do

full equity to the State of Kansas in respect to the administration and use of the waters of the Arkansas River whenever called upon so to do and whenever the State of Kansas in this tribunal reopens or prays to reopen the matters involved as between the states within the permission given and the jurisdiction reserved by this Court in the case of *Kansas vs. Colorado*, but this complainant submits that no other court than this has, upon the general doctrines of law, or the Constitution of the United States or under the specific adjudication arrived at and the principles laid down as the law of the case in the case of *Kansas vs. Colorado*, any authority or jurisdiction whatsoever to adjudicate upon the relative rights of Colorado and its citizens and appropriators and of the State of Kansas, its citizens and water users.

TWENTY-FIRST

Your complainant has no adequate remedy at law, or any remedy at law, nor any remedy in any court whatsoever except this Supreme Court of the United States, in respect to the matters herein set forth.

WHEREFORE, the State of Colorado prays that this Honorable Court may cause its subpoena or other proper process to issue under the seal of this Court, summoning the sovereign State of Kansas and The Finney County Water Users' Association each as defendants to appear herein, present their answers, if any, and abide by the determination of this Court; that this Honorable Court may temporarily during the pendency of this cause and permanently upon the termination hereof prohibit and enjoin the defendant corporation The Finney County Water Users' Association from the further prosecution and carrying on of all and any of the litigation between individuals in the United States District Court for Colorado hereinbefore described and named or any other suits or causes on the same or similar claims; that this Honorable Court may enjoin the State of Kansas and its other citizens or inhabitants from litigating the relative

rights of the two states and their citizens to the waters of the Arkansas River except by proper proceedings in this Honorable Court, and that this Honorable Court may reserve to itself sole jurisdiction and protect itself in its sole jurisdiction over the determination of the use of the waters of the Arkansas River as between the States of Colorado and Kansas, may protect and quiet the rights of the State of Colorado, its officers, citizens, corporations, and its inhabitants under the adjudication in *Kansas vs. Colorado,* and may give such other, further and different relief as may be just and equitable.

THE STATE OF COLORADO,

By WILLIAM L. BOATRIGHT,
Attorney General of the State of Colorado.

PLATT ROGERS,
JAMES GRAFTON ROGERS,
FRED A. SABIN,
HENRY A. DUBBS,
A. WATSON MCHENDRIE,
Of Counsel.

RALPH L. CARR,
Assistant Attorney General,
Solicitors for Complainant.

FILED
FEB 20

In the Supreme Court of the United States.

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

Motion by Defendants for Leave to File a Motion to Dismiss the Bill of Complaint in Equity and the Case, for time in Which to Serve upon Solicitors for Complainant Copies of a Brief in Support of Such Motion to Dismiss and in Which to File Copies of Such Brief With the Clerk of This Court, and, Also, for a Setting Down of Such Motion to Dismiss for Oral Argument.

Notice of Motion.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
CHESTER I. LONG,
Solicitors for The Finney County Water Users' Association, a Corporation.

In the Supreme Court
of the United States.

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

Motion by Defendants for Leave to File a Motion to Dismiss the Bill of Complaint in Equity and the Case, for time in Which to Serve upon Solicitors for Complainant Copies of a Brief in Support of Such Motion to Dismiss and in Which to File Copies of Such Brief With the Clerk of This Court, and, Also, for a Setting Down of Such Motion to Dismiss for Oral Argument.

Come now the State of Kansas and The Finney County Water Users' Association, a corporation, defendants in the foregoing entitled case, and move the Court for leave to file forthwith their motion to dismiss the bill of complaint in equity and the case.

Defendants also move the Court for leave to serve upon solicitors for complainant, on or before March 3, 1928 (a brief), in support of such motion to dismiss, and to file with the clerk of this Court,

copies of such brief on or before March 24, 1928, and also move the Court to set down for oral argument such motion to dismiss.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas.
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas.
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH.
CHESTER I. LONG,
Solicitors for The Finney County Water Users' Association, a Corporation.

ACKNOWLEDGMENT OF SERVICE:

Copy of the foregoing motion was received by me February 6, 1928.

(Signed) WM. L. BOATRIGHT,
Solicitor for Complainant.

In the Supreme Court of the United States.

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

NOTICE.

To: The State of Colorado, Complainant in the Above-entitled Cause,
and to
William L. Boatright and Others, Its Solicitors.

You are hereby notified that, on Monday, February 20, 1928, or as soon thereafter as may be, the State of Kansas and The Finney County Water Users' Association, a corporation, defendants in the above-entitled case, will move the said Court for leave to file their motion to dismiss the bill of complaint in equity and the case, and also for leave to serve and file, within some period of time then to be granted, the brief for the defendants in support of said motion to dismiss, and, also, will present to the Court their

motion to set down said motion to dismiss for oral argument at some time to be fixed by the Court.

Copies of said motion to dismiss are presented herewith.

This notice is dated February 1, 1928.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas.
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas.
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
CHESTER I. LONG,
Solicitors for The Finney County Water Users' Association, a Corporation.

ACKNOWLEDGMENT OF SERVICE.

Service is acknowledged upon the solicitors for the State of Colorado, complainant in the above-entitled cause, of a copy of the foregoing notice and, also, of copies of defendants' motion to dismiss the bill of complaint in equity and the case referred to in said notice.

Dated February 6, 1928.

(Signed) WM. L. BOATRIGHT,
Attorney-general of the State of Colorado,
Solicitor for Complainant.

FILE COPY

Office Supreme Court, U.S.
FILED
FEB 27 1928

In the Supreme Court of the United States.

[redacted] 976

No. 16, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

MOTION TO DISMISS THE BILL OF COMPLAINT IN EQUITY AND THE CASE.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

12-2227

In the Supreme Court
of the United States.

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

MOTION TO DISMISS THE BILL OF COMPLAINT IN EQUITY AND THE CASE.

Come now the State of Kansas and The Finney County Water Users' Association, a corporation, organized and existing under the laws of the state of Kansas, which are named as defendants in the foregoing entitled case, and each severally moves the court to dismiss the bill of complaint in equity filed by the complainant in said case, the State of Colorado, for want of jurisdiction of this court over the bill of complaint and case, and for want of equity apparent on the face of the bill of complaint and, as detailed grounds of this motion, state:

I.

The claims asserted in the case, referred to in paragraph twelfth of said bill of complaint in equity, which was brought by the United States Irrigating Company, a corporation of Kansas, as complainant, against the Graham Ditch Company and others, as defendants, were for priority of rights in the appropriation of water flowing in

the Arkansas river in Kansas, as against claims of appropriation of water by the defendants, flowing in the Arkansas river, or its tributaries, in Colorado.

II.

The claims asserted in the case, referred to in paragraph twelfth of said bill of complaint in equity, which was brought by The Finney County Water Users' Association, a corporation, as complainant, against The Graham Ditch Company and others, as defendants, are for priority of rights in the appropriation of water flowing in the Arkansas river in Kansas, as against claims of appropriation of water by the defendants, flowing in the Arkansas river, or its tributaries, in Colorado.

III.

The decision and judgment of the Supreme Court of the United States in the case of *Kansas v. Colorado*, the opinions in which were reported in volume 185, United States Reports, page 125, and in volume 206, United States Reports, page 46, referred to in paragraphs seventh, eighth, ninth, tenth, eleventh, twelfth, thirteenth, seventeenth, nineteenth, twentieth and in the prayer of said bill of complaint, did not pass upon any claims or rights of priorities to the appropriation of water from the Arkansas river, or its tributaries, as between the United States Irrigating Company, a corporation of Kansas, or the Finney County Water Users' Association, a corporation, on the one side, and any municipality, resident, or citizen of Colorado, on the other side, or as between any municipality, citizen or resident of Kansas, on the one side, and any municipality, citizen, or resident of Colorado, on the other side.

IV.

The bill of complaint does not make any definite or specific allegation that any municipality, citizen or resident of Kansas threatens to or will bring any suit against any municipality, citizen or resident of Colorado, to present any question of priorities of claims or rights to the appropriation of water from the Arkansas river in Kansas and said river, or its tributaries, in Colorado, or to obtain any decree or judgment against any defendant on account of the taking of water by him or it from said river, or its tributaries, in Colorado.

V.

The bill of complaint does not allege that the State of Kansas has threatened to bring any suit against the State of Colorado, or against any municipality, citizen, or resident of Colorado, involving any claim of rights to priorities in appropriation of water flowing in the Arkansas river, or its tributaries, as between any municipality, citizen or resident of Kansas, on the one side, and any municipality, citizen, or resident of Colorado, on the other side, or to obtain any decree or judgment against any defendant on account of the taking of water by him or it from said river, or its tributaries, in Colorado.

VI.

The bill does not make a party thereto any municipality, citizen, or resident of Colorado, or any municipality, citizen, or resident of Kansas, which would or might be affected by any decree in this case, other than The Finney County Water Users' Association.

VII.

The State of Colorado has no right to maintain this suit in order to litigate and have determined, or prevent the litigation or determination of, any question of priority of claims or rights to appropria-

tion of water from the Arkansas river in Kansas, or said river and its tributaries in Colorado, as between The Finney County Water Users' Association, a corporation of Kansas, or any municipality, citizen or resident of Kansas, on the one side, and any municipality, citizen or resident of Colorado, on the other side.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas.
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas.
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

12-2227

FILE COPY

Supreme Court, U. S.
MAR 8 1928

In the Supreme Court of the United States.

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

Brief for Defendants on Their Motion to Dismiss the Bill of Complaint in Equity and the Case.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.
F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

12-2441

INDEX.

PAGE

SOME ALLEGATIONS IN THE BILL OF COMPLAINT 5

THE MOTION TO DISMISS 10

POINTS AND AUTHORITIES:

Effect of the judgment in Kansas v. Colorado 11

The bill should not be entertained to avoid multiplicity of suits 11

Interference with Colorado water administration should not prevent decrees 12

Review by this Court on certiorari of decrees of the District Court 12

The rights of water appropriators not parties to that suit were not determined by the decision in Kansas v. Colorado, 12

Appropriators of water from a river may assert their priorities, regardless of state line 13

Both riparian and appropriation rights have been recognized by California, Montana and Nebraska 13

The statutes of Kansas have recognized and do recognize the right to appropriate water for the purpose of irrigation 13

DISCUSSION OF THE BILL 14

THE EFFECT OF THE DECISION IN KANSAS V. COLORADO 30

THE FEDERAL COURTS HAVE UNIFORMLY UPHELD THE RIGHTS OF PRIVATE APPROPRIATORS TO ASSERT THEIR PRIORITIES REGARDLESS OF STATE LINES 34

CONCLUSION 41

STATUTES OF KANSAS CONCERNING APPROPRIATION OF WATER FOR IRRIGATION 37–39

General Statutes of Kansas, 1868, chap. 23, art. 2, sec. 5 (p. 192); chap. 23, art. 2, sec. 89 37

Laws of Kansas, 1872, chap. 105 37

Laws of Kansas, 1876, chap. 58 37

Revised Statutes, Kansas, 1923, secs. 13-606 and 13-608 38

Laws of Kansas 1886, chap. 115 38

Laws of Kansas, 1889, chap. 165 38

Laws of Kansas, 1891, chap. 133 39

Laws of Kansas, 1899, chap. 95 39

Laws of Kansas, 1899, chap. 151 39

In the Supreme Court
of the United States.

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

Brief for Defendants on Their Motion to Dismiss the Bill of Complaint in Equity and the Case.

The defendants have filed a motion to dismiss the bill in equity and the case. This motion is separately printed, but the points contained therein are hereinafter indicated.

Some Allegations in the Bill of Complaint.

The bill of complaint in equity filed by Colorado seeks to prevent the determination of priority in water appropriations between the Finney County Water Users Association in Kansas and a large number of appropriators in Colorado which take water from the Arkansas river and its tributaries.

Some of the points alleged in the bill of complaint are as follows, referring to the bill by paragraphs:

PARAGRAPH SECOND: The Finney County Water Users Association is a Kansas corporation, organized to operate an irrigation canal

taking water from the Arkansas river in Kansas to irrigate lands in that state.

PARAGRAPH THIRD: The Arkansas river and its course are described and the dependency on the water therein of irrigators in Colorado.

PARAGRAPH FOURTH: Some irrigation has been practiced by which about 40,000 acres of land have to some extent been irrigated in Kansas.

PARAGRAPH FIFTH: The legislation and administration by Colorado in water appropriation and irrigation matters.

PARAGRAPH SIXTH: The constitution, and some statutes and decisions of Colorado and some litigation with New Mexico on that subject.

PARAGRAPH EIGHTH: The development of irrigation by water from the Arkansas river and its tributaries in Colorado. An adjudication of priority of rights in Kansas appropriators would disrupt the administration of the Colorado irrigation laws. The case of *Kansas v. Colorado* in this Court began about May 20, 1901, in which various water appropriators in Colorado were made defendants, the intervention by the United States in that suit, and the decision by this Court of May 13, 1907, therein; and that there might be equitable limitations on the rights of Colorado in the use of water from the Arkansas river. The record and proceedings in that case are made a part of the bill of complaint by reference.

PARAGRAPH NINTH: The reliance of Colorado upon the decision in *Kansas v. Colorado.*

PARAGRAPH TENTH: The developments in Colorado in reliance upon decision in *Kansas v. Colorado.*

PARAGRAPH ELEVENTH: The suits begun and maintained by citizens of Kansas in the United States District Court of Colorado

against parties in Colorado as to the respective rights of the complainants and defendants in those suits to the use of the water from the Arkansas river and the effect of such suits.

PARAGRAPH TWELFTH: Reference is made to the suits referred to in paragraph eleventh, and such suits are specifically described.

One brought about August 27, 1910, by the United States Irrigating Company, a Kansas corporation, against various water appropriators in Colorado. It is alleged that the state of Colorado and the state of Kansas was neither a party to that suit, and that the suit was settled.

Another suit brought by the Finney County Water Users Association about November 27, 1916, against the Graham Ditch Company *et al.*, appropriators of water in Colorado; and another by the same complainant brought about January 23, 1923, against the Coler Ditch Company *et al.*, on the same subject.

These suits are alleged to have been brought in the United States District Court in Colorado, and to involve questions of priority in water rights as to water taken from the Arkansas river in Colorado and Kansas.

It is further alleged in paragraph twelfth, page 31 of the bill, that the state of Kansas has not sought or asserted any rights in the United States District Court in Colorado, and the state of Colorado has not submitted itself to the jurisdiction of that Court. Unless The Finney County Water Users Association is enjoined in this suit that association will offer testimony, and require the defendant in that suit to offer testimony and cause to be adjudicated in the United States District Court in Colorado the relative rights in water appropriations of the plaintiff and defendant therein; and also the relative rights of the state of Colorado and the state of Kansas as a whole.

PARAGRAPH THIRTEENTH: The relations of the issues and parties in those suits in the United States District Court in Colorado to the litigation and decision in the case of *Kansas v. Colorado.*

PARAGRAPH FOURTEENTH: That any adjudication in the United States District Court in Colorado of the two pending cases by the Finney County Water Users Association would interfere with and disrupt the administration of water appropriation rights by Colorado. These suits are stated to involve questions of priorities.

PARAGRAPH FIFTEENTH: The control by the state of Colorado over water appropriations and some reservoirs constructed by Colorado to store water from tributaries of the Arkansas river and the use for irrigation by some public institutions in Colorado of water from that river or its tributaries.

PARAGRAPH SIXTEENTH: Negotiations between the state of Colorado and the state of Kansas to settle their sovereign rights as to the waters, and thereby the rights of the citizens and appropriators within their boundaries. No conclusion is alleged of such negotiations.

PARAGRAPH SEVENTEENTH: The users of water in each state derive their rights from their respective states. The effect of a decision in the cases brought by the Finney County Water Users Association.

PARAGRAPH EIGHTEENTH: The effect of the pendency of the cases brought by the Finney County Water Users Association upon the defendants therein and that no appeal lies of right from a decree in such suits to this Court.

PARAGRAPH NINETEENTH: Various effects that will follow from the continuance of said suits brought by the Finney County Water Users Association, one of which will be that it will determine the relative individual usufructuary relations between the water users of the two states.

PARAGRAPH TWENTIETH: The state of Colorado offers to do equity to the state of Kansas in respect to the administration and use of the waters of the Arkansas river.

PARAGRAPH TWENTY-FIRST: The prayer.

There is no allegation that the state of Kansas threatens or intends to bring a suit against the state of Colorado, or against any parties in Colorado, to present questions of rights to the use of water from the Arkansas river, or its tributaries.

There is no allegation that any party, other than the Finney County Water Users Association, is maintaining any suit against any parties in Colorado presenting any questions of such water rights.

There is no allegation that any party in Kansas threatens or intends to bring a suit against any party in Colorado to present any such questions as to water rights. Of course there are allegations concerning the pendency of the two suits referred to by the Finney County Water Users Association, and that such two suits will be prosecuted unless the Finney County Water Users Association is prevented therefrom by order of this Court.

The allegations show that the questions presented in the two suits brought by the Finney County Water Users Association are of priorities of rights of appropriation of water from the Arkansas and its tributaries in Colorado and the Arkansas river in Kansas.

There is no allegation that the two suits brought by the Finney County Water Users Association present any questions merely of riparian rights, as distinguished from water appropriation rights for irrigation.

The Motion to Dismiss.

The defendants, the State of Kansas and the Finney County Water Users Association, have filed a motion to dismiss the bill of complaint in equity and the case for want of jurisdiction of the Court and for want of equity apparent on the face of the bill.

The points presented by the motion are these:

1. That the claims asserted in paragraph twelfth of the bill, concerning the suit which had been brought and was afterwards settled, of *The United States Irrigating Company, a Kansas Corporation, v. The Graham Ditch Company et al.*, were for a priority of rights and appropriation of water flowing in the Arkansas river.

2. The claims asserted in the bill, referred to in paragraph twelfth thereof, in a suit brought by *The Finney County Water Users Association v. The Graham Ditch Co. et al., and The Coler Ditch Company et al.*, were for such priority of rights.

3. The decision and judgment of the Supreme Court of the United States in the case of *Kansas v. Colorado*, reported in 185 U. S. 125, 46 L. Ed. 838, and 206 U. S. 46, 51 L. Ed. 956, referred to in the bill, did not pass upon any claims for or rights of priorities to the appropriation of such water, as between the United States Irrigating Company or the Finney County Water Users Association, on the one side, and any party in Colorado on the other side.

4. The bill of complaint does not make any specific allegation that any party in Kansas threatens to or will bring any suit against any party in Colorado to present any question of such priorities of rights, other of course than the pending suits by the Finney County Water Users Association.

5. The bill of complaint does not allege that the state of Kansas has threatened or intends to bring any suit against the state of Colorado, or against any party in Colorado, involving any claim

of such rights, between any party in Kansas on the one side and any party in Colorado on the other side, involving any such priorities, or to obtain any decree on any such question.

6. The bill does not make a party thereto any party in Colorado or in Kansas which might be affected by any decree of this case, other than the Finney County Water Users Association.

7. The state of Colorado has no right to maintain this suit in order to have determined, or to prevent the litigation of, any question of such priorities as between the Finney County Water Users Association on the one side and any party of Colorado on the other side.

Points and Authorities.

The judgment in Kansas v. Colorado did not pass upon any question of priorities in water rights between water appropriators in Kansas and Colorado.

Kansas v. Colorado, 185 U. S. 125, 46 L. Ed. 838, and 206 U. S. 46, 51 L. Ed. 956.

As the questions of law and fact are different in controversies between appropriators of water from the Arkansas river and its tributaries in Colorado and from the Arkansas river in Kansas, this bill should not be entertained on the theory of avoiding multiplicity.

2 Story's Equity Jurisprudence, 14 ed., secs. 1174, 1177.

Hale v. Allinson, 188 U. S. 56, 78-80, 47 L. Ed. 380.

Kirwan v. Murphy, 189 U. S. 35, 54, 37 L. Ed. 698, 705.

U. S. v. Bitter Root Investment Company, 200 U. S. 451, 479, 50 L. Ed. 550.

Boise Artesian Hot & Cold Water Co. v. Boise City, 213 U. S. 276, 286, 53 L. Ed. 796.

St. Louis & Iron Mountain Ry. Co. v. McKnight, 244 U. S. 368, 375, 376, 61 L. Ed. 1200.

Kelly v. Gill, 245 U. S. 116, 121, 122, 62 L. Ed. 185.

Barstow v. Mingo Drainage District, 264 F. 224.
Carey v. McMillan, C. C. A. 8th Circuit, 289 F. 380, 384.
Rochester German Ins. Co. v. Schmidt, 175 F. 720, 99 C. C. A. 296.
Mechanics Ins. Co. v. Hoover Distilling Co., 173 F. 888, 97 C. C. A. 400, 31 L. R. A., n. s., 873.
Kansas City, &c., Ry. Co., v. Quigley, 181 F. 190.
Pittsburgh & W. V. Railway Co. v. U. S., 6 Fed. (2d) 646, 649.
Mountain Lumber Co. v. Davis, 11 F. (2d) 219, 220, C. C. A. 2d Circuit. Writ of certiorari denied. 271 U. S. 674, 70 L. Ed. 1145.
Kieffer v. Kinney Coastal Oil Co., 9 Fed. (2d) 260. 264, C. C. A. 8th Circuit.

Interference by decrees, in the two suits brought in the United States District Court in Colorado by the Finney County Water Users Association, of the Colorado irrigation administration, is not a defense against the entering of decrees in favor of the plaintiff in those suits.

Ex parte New York, 256 U. S. 490, 502, 503, 65 L. Ed. 1057, 1063.

If grounds should exist therefor the losing parties in the cases in the United States District Court in Colorado could obtain a review by this Court of the decrees of that Court through writs of certiorari.

Sec. 347 U. S. Code 1926, amending sec. 240, Judicial Code.
2 Mason's U. S. Code Annot. Title 28, ch. 9, sec. 347, 43 St. L. 938.

The rights of water appropriators not parties to that suit were not determined by the decision in Kansas v. Colorado.

Brandon v. Ard, 211 U. S. 23, 53 L. Ed. 68.

Appropriators of water from a river may assert their priorities, regardless of state line.

Wyoming v. Colorado, 259 U. S. 419, 66 L. Ed. 999.
Hoge v. Eaton, 135 Fed. 411.
Weiland v. Pioneer Irrigation Co., 259 U. S. 498, 66 L. Ed. 1027.
Miller and Lux v. Rickey, &c., Co., 137 Fed. 573.
Rickey, &c., Co. v. Miller and Lux, 218 U. S. 258, 54 L. Ed. 1032.
Lux v. Haggin, 69 Cal. 255.
Katz v. Walkinshaw, 141 Cal. 117.
Bean v. Morris, 221 U. S. 485, 55 L. Ed. 821.

Both riparian and appropriation rights have been recognized by California, Montana and Nebraska.

Lux v. Haggin, 69 Cal. 255.
Katz v. Walkinshaw, 141 Cal. 117.
4 Kinney on Irrigation, 2d ed., sec. 1786.
Smith v. Denniff, 24 Mont. 20.
4 Kinney on Irrigation, 2d ed., sec. 1880.
Crawford County v. Hathaway, 67 Neb. 325, 93 N. W. 781.
4 Kinney on Irrigation, 2d ed., sec. 1889.

The statutes of Kansas have recognized and do recognize the right to appropriate water for the purpose of irrigation.

General Statutes of Kansas, 1868, chap. 23, art. 2, sec. 5 (p. 192), chap. 23, art. 2, sec. 89.
Laws of Kansas, 1872, chap. 105.
Laws of Kansas, 1876, chap. 58.
Revised Statutes, Kansas, 123, secs. 13-606 and 13-608.
Laws of Kansas, 1886, chap. 115.
Laws of Kansas, 1889, chap. 165.
Laws of Kansas, 1891, chap. 133.
Laws of Kansas, 1899, chap. 95.
Laws of Kansas, 1899, chap. 151.
Laws of Kansas, 1895, chap. 155.

Revised Statutes, Kansas, 1923: Clause 37, sec. 17-202; secs. 42-109 to 42-118; 42-120; 42-316 and 42-317, 42-101 to 42-108; 42-120 to 42-122; 42-301 to 42-304; 42-310 to 42-315; 42-321 to 42-3111.

Conf. Clark v. Allaman, 71 Kan. 206.

Discussion of the Bill.

We have read and reread the bill carefully and confess ourselves in doubt as to what form of relief the complainant is seeking. In its motion for leave to file the bill it speaks of it in the following language: "in the nature principally of a bill of peace."

The prayer asks that the Finney County Water Users Association be prohibited and enjoined from further prosecuting and carrying on the litigation referred to in the United States District Court for Colorado and that the state of Kansas and its citizens or inhabitants be enjoined from litigating the relative rights of the two states and their citizens to the waters of the Arkansas river except by proceedings in this Court. The judge of the United States District Court in Colorado is not made a party defendant, although it is alleged that that Court is without jurisdiction; an allegation proper to an application for a writ of prohibition.

The bill describes correctly the nature of the two cases pending in the United States District Court for Colorado in which the defendant, the Water Users Association, is plaintiff; one against the Graham Ditch Company *et al.* and the other against the Coler Ditch Company *et al.*; they are actions to assert priority over the defendants of 250 second-feet of the flow of the Araknsas river and to enjoin the defendants from diverting any water from the river until the appropriation of the defendant, Water Users Association, has been satisfied.

Ordinarily a court will not take judicial notice of the pleadings or proceedings in another cause, even though it is pending in the

same court or decided by the same judge, but where, as in a bill of peace, or an application for a writ of prohibition, action of the lower court is sought to be curbed or ousted by this Court, we think the rule is that this Court will take judicial knowledge of the proceedings in the cases complained of. As stated in the bill, the case of *The Finney County Water Users Association against the Graham Ditch Company et al.* was begun in November, 1916. A motion to dismiss was filed. Judge Lewis refused to pass on this motion until the final decision in the case of *Wyoming v. Colorado*, 259 U. S. 419, 66, L. Ed. 999, so the case remained in that shape until this Court in the last-mentioned case decided that political divisions and state lines do not interfere with the right of prior appropriation. In the meanwhile Judge Lewis had been promoted to the Circuit Court of Appeals and Judge Symes appointed in his place. The motion was then argued and elaborately briefed. We have here attempted to anticipate the contentions of the complainant to avoid a reply brief because we are satisfied that they intend to raise here all of the contentions that were fully set out and briefed in the Graham Ditch Company case, and all of which were overruled by Judge Symes. The defendants were put to answer. The plaintiff spent a year and a half taking its testimony of some 2,500 pages and rested its case in June, 1927. The testimony was taken by depositions. This case involved only the diversion of water from the main stream of the Arkansas, but it had developed that beginning about 1902 or 1903 Colorado appropriators had constructed vast reservoirs on the tributaries of the Arkansas, impounding millions of acre-feet of water, which were intended to and do now impound and hold all of the flood waters of these streams. These floods in the summer time from rains in the mountains are frequent and the surplus of them formerly passed down the river to the defendant's, Water Users Association, ditch and gave an occasional

run of water in the growing season. The construction of these reservoirs has completely cut off the ordinary flood waters from the defendant, to its very great detriment and loss. So in 1922 the suit was brought against the Coler Ditch Company *et al.*, defendants, taking water from the tributaries of the Arkansas. It is alleged that not all of those who divert water from the tributaries have been made parties to that suit. We submit that that is not a ground for a bill of peace or prohibition; that is a matter for the lower Court. A motion to dismiss was interposed in that Court and overruled and the defendants have answered.

In both of these cases the defendants had raised a question of jurisdiction, both by their motion and their answer; they had urged, as they do here, that under the decision of *Kansas v. Colorado*, 206 U. S. 46, 103, 51 L. Ed. 956, no one but the state of Kansas can maintain any action for diversion of the flow of the Arkansas in Colorado; that the water users had no standing in Court and the Court no jurisdiction as between these individual appropriators. There is no doubt as to their having urged these objections in a timely way and at every possible stage of the case, so unless they have some new theory as to the law we are pretty well advised as to their contention. From the description in the bill it clearly appears that these two cases sought to be enjoined and stopped are purely suits for the priority of appropriation between irrigators on the same stream; suits between private corporations, individuals, and copartnerships to establish individual rights and to prevent individual wrongs.

Turning again to the bill and expressing our doubt as to the form of relief sought, we note that in the motion of the attorney-general for leave to file its bill he says that his "bill is in the nature principally of a bill of peace"; as to what the rest is he does not enlighten the Court either in the motion or the bill. There are allega-

tions in the bill that would be pertinent to a bill of peace, others utterly not pertinent to such a remedy, but possibly pertinent in an application for a writ of prohibition; but if the bill is to be treated as a bill of peace it is fatally defective in two particulars.

It will be conceded that the equity jurisdiction here involved is for the sole purpose of preventing a multiplicity of suits. The purpose of a bill of peace is thoroughly well settled in a case like this. The complainant alleges that the Finney County Water Users Association is harassing and threatening to harass many parties in Colorado by the prosecution of two suits in the United States District Court in Colorado. It therefore asks this Court to take jurisdiction of the entire controversy, and render one judgment that will settle the whole controversy. We think there will be no dispute upon that point. Counsels' idea seems to be that they can enjoin the defendant, the Water Users Association, from continuing its private litigation without affording it any remedy elsewhere; that this Court may enjoin the defendant Water Users Association from asserting its claim and rights in a private suit against private parties in a court having jurisdiction of the defendant parties and of the subject matter. We challenge them to find any case where any court of equity has ever, under the guise of a bill of peace, taken jurisdiction of controversies to prevent multiplicity of suits without taking jurisdiction of all of the controversies, and thus affording the parties relief by the broad jurisdiction of equity.

No case can be cited where a bill has been entertained, whose sole and avowed purpose, as shown by the allegations and the prayer of the bill, is simply to stop the litigation in the court below, to prevent the assertion of private rights and leave the defendant Water Users' Association, as an injunction here would leave it, without any remedy whatever, and permit the Colorado water users to

continue that course of spoliation of that defendants' rights which has been so profitable to them for over forty years. That is the object of the bill.

There is another fatal objection to the bill that if there were alleged to be any other parties in Kansas than the Finney County Water Users Association which are litigating or threatening litigation against the water users in Colorado, and there is no such allegation, there is nothing to show that their claims to be the same in order of appropriation, or based upon the same facts. It appears from the bill that in the two cases brought by the Finney County Water Users' Association against various parties in Colorado the questions presented are of priorities of respective water rights between the plaintiff and the various defendants. The controversy between each of those defendants and the Finney County Water Users Association would be separate upon the facts, depending upon different priorities. While the decisions in the state courts are in some confusion with relation to such circumstances, the decisions of this Court are clear that where there are several or many distinct controversies to be considered it will not take jurisdiction of a bill of peace. Under such circumstances there is no avoidance of multiplicity of litigation, and the result of the bill of peace would be merely to take into one suit many different and independent lawsuits. Under the rule followed by this Court that cannot be done.

On this subject it is said in 2 Story's Equity Jurisprudence, 14th ed.:

> "SEC. 1174. *Use of Bill of Peace to Prevent Multiplicity of Suits.*—One class of cases to which this remedial process is properly applied is where there is one general right to be established against a great number of persons. And it may be resorted to either where one person claims or defends a right against many, or where many claim or defend a right against one. In such cases courts of equity interpose in order to prevent multi-

plicity of suits; for as each separate party may sue or may be sued in a separate action at law, and each suit would only decide the particular right in question between the plaintiff and defendant in that action, litigation might become interminable. Courts of equity, therefore, having a power to bring all the parties before them, will at once proceed to the ascertainment of the general right; and if it be necessary, they will ascertain it by an action or issue at law, and then make a decree finally binding upon all the parties."

"SEC. 1177. *There Must Be a Clear Right Affecting Many Persons.*—But to entitle a party to maintain a bill of peace, it must be clear that there is a right claimed which affected many persons, and that a suitable number of parties in interest are brought before the court; for as the right is disputed between two persons only, not for themselves and all others in interest, but for themselves alone, the bill will be dismissed, for it cannot then conclude any persons but the very defendants."

Perhaps the leading case on this subject is *Hale v. Allinson*, 188 U. S. 56, 78, 80; 47 L. Ed. 380. In that case the receiver of an insolvent Minnesota bank brought a suit in equity to recover the statutory liability of certain stockholders in the bank residing in Iowa. The Court considers the whole matter. It affirms the decision of Judge McPherson of the trial court and adopts his language, in which he points out that the defendant stockholders have no common interest; that their defenses would be different; that it would make long, drawn out, and expensive litigation, and that it would not, as is the purpose of this branch of equity, bring peace. And the Court says that in that case it would put the defendants to much greater inconvenience to be so joined than would be compensated for by the superior conveniences of a single plaintiff. And the Court further holds that to warrant this interpretation of equity there must be a community of law and of fact between them; that is, the law and the facts must be the same as to each one of them, and applying that test it denied the jurisdiction, and the bill was dismissed.

This case was followed and approved in *Kirwan v. Murphy*, 189 U. S. 35, 54, 37 L. Ed. 698, 705, and in *U. S. v. Bitter Root Investment Company*, 200 U. S. 451, 479, 50 L. Ed. 550.

In order to maintain a bill of peace to avoid multiplicity of suits something more is required than the beginning of a single action by a defendant with honest purpose to settle the rights of the parties. Suit to enjoin the enforcing of an ordinance imposing a monthly municipal license tax upon a public service water company.

Boise Artesian Hot and Cold Water Co. v. Boise City, 213 U. S. 276, 286, 53 L. Ed. 796.

A bill of peace will not lie against several defendants by a railroad carrier to enjoin the bringing of suits by the defendants to recover alleged overcharges for transportation of freight and passengers. The claim of each defendant presents a separate controversy as to questions of fact. The bill contains no allegation that a controverted question of law, common to all the claimants, is involved which will determine their right to recovery, or even that there is involved a question of law, not fundamental, in which they have a common interest.

St. Louis & Iron Mountain Ry. Co. v. McKnight, 244 U. S. 368, 375, 376, 61 L. Ed. 1200.

A bill against stockholders to collect unpaid subscriptions to stock would not lie. The controversies were separate on the law and the facts.

Kelley v. Gill, 245 U. S. 116, 121, 122, 62 L. Ed. 185.

A bill of peace will not lie where the questions of fact and law are separate as to the several defendants.

Barstow v. Mingo Drainage District, 264 F. 224.

In order that a bill of peace to prevent multiplicity of suits can be maintained, the other suits must be such that the plaintiff in the bill of peace will be a necessary party thereto.

Carey v. McMillan, C. C. A. 8th Circuit, 289 F. 380, 384.

A bill of peace will not lie to avoid multiplicity of suits where the claims of the defendants are separate and distinct as to facts and law. On the same proposition see the following three cases, in each of which there is a full discussion of the law.

Rochester German Insurance Co. v. Schmidt, 175 F. 720, 99 C. C. A. 296.

Mechanics Insurance Company v. C. A. Hoover Distilling Co., 173 F. 888, 97 C. C. A. 400; 31 L. R. A., n. s., 873.

Kansas City, &c., Ry. Co. v. Quigley, 181 F. 190.

On the same point see, also—

Pittsburgh & W. V. Ry. Co. v. U. S., 6 Fed. (2d) 646, 649, United States District Court, Western District of Pennsylvania.

In order that a bill of peace should lie it is not sufficient that each of the parties plaintiff and defendant has an interest in the determination of the same legal proposition. This bill was for an accounting of alleged freight overcharges on many separate shipments by different shippers.

Mountain Lumber Co. v. Davis, 11 F. (2d) 219, 220, C. C. A. 2d Circuit. A writ of certiorari was denied (271 U. S. 674, 70 L. Ed. 1145).

A bill of peace will not lie where the questions of fact and law are separate. This was a bill to determine the separate rights of a number of parties in eighty acres of land in the Wyoming oil fields.

Kieffer v. Kinney Coastal Oil Co., 9 Fed. (2d) 260, 264, C. C. A. 8th Circuit.

There is no allegation in the bill that the state of Kansas has now any action pending on the subject matter described, or intends or threatens to bring any action concerning the flow of the Arkansas river or the diversions therefrom in the state of Colorado. What remains then? Nothing but the two suits described between private corporations over private rights. In order for this Court to take jurisdiction the bill would have to be amended so as to include and describe every person, firm and corporation in Kansas in a situation similar to the defendant, Water Users Association, who might bring similar suits. These parties would have to be impleaded in this suit in order that the Court, under well-settled rules, may hear and determine the whole controversy.

However, there is no allegation that any parties in Kansas threaten to bring any new suit. And to that end every defendant in the case of *The Water Users Association v. The Graham Ditch Company et al.*, and *The Water Users Association against the Coler Ditch Company et al.*, must be impleaded in this Court in this action, for otherwise the Court could not determine the entire controversy; their rights and defenses must be heard and determined, as between them and all of the parties interested on the Kansas side. Not only that, but if, as counsel say, there are many other parties in Colorado whose rights are affected by this litigation who, as they say, ought to have been made parties in the court below because any adjudication of the rights involved will affect them, then they must have their day in court. So this Court would find itself trying purely private controversies between private parties, without any public interests involved, involving anywhere from 130 to several hundred if the statements of the bill are correct. Evidence must be taken as to the rights of each individual appropriator in Colorado. This Court cannot embark upon such litigation.

This Court would be required to take full and entire jurisdiction of the entire controversy; the bill of complaint must be amended as we have suggested, all of the parties in Colorado likely to be affected must be made parties and the process of this Court issued to bring them into Court; each will have the right to file its separate answer and make its separate defense. There would thereby not be any avoidance of burdensome litigation. This Court is asked to use its injunctive process to prevent the defendant Water Users Association from further maintaining its private suits against private parties and of seeking to establish its claimed rights against the defendants in the cases below, without affording it a remedy, a day in court and a determination of the rights in this equitable tribune. No court has ever done that, either in England where this jurisdiction originated or in the United States where it has been adopted.

Since the bill does not allege that the state of Kansas is threatening to bring any suit or has any intention of bringing any suit, what action can this Court take at the solicitation of the complainant as against the state of Kansas? Can the state of Kansas be drawn into litigation which it is not contemplating, which it has no intention of bringing, make it a party and compel it to go to the expense of litigation against its will, since this Court, if it entertains this bill, must settle the whole controversy, not only as to the private irrigators, hostile to each other in the two states, but also as to the state of Kansas here made a defendant. We would have the curious situation of a sovereign state being brought into this Court and compelled against its inclination by a cross bill to proceed with litigation that it has not contemplated and which it has no intention of entering. Certainly this would be a most extraordinary proceeding, and yet apparently that is what counsel contemplate. The question of the present interest of the state of Kansas in this controversy we

discuss fully in a later section of this brief. It is sufficient to say here that the twenty-five years that have elapsed since *The State of Kansas v. Colorado* was commenced have changed conditions with reference to the principal contention of the state of Kansas in that case, which related to the underflow and its benefits to agriculture in the Arkansas valley.

The bill alleges that the counsel who wrote it "are informed" that they have no right of appeal to this Court from the cases pending below. What of it? A bill of peace is not sustained because the complainant has no right of appeal from the judgments where vexatious litigation is pending or threatened to be brought, but to prevent a multiplicity of lawsuits, and it is immaterial as to whether there is any right of appeal in these cases. This is a point in an application for a writ of prohibition, because usually the court will not interfere by prohibition where the complaining parties have the right of access to this Court by appeal of certiorari. It is not necessary in any event that the party should have a right of access to this Court by appeal. If he may come here by certiorari for error apparent prohibition will not lie, and in the cases described and which are complained of we are satisfied that the defendants in these cases may reach this Court by certiorari as other similar litigants in like cases have done before: (Sec. 347, U. S. Code 1926, amending sec. 240 Judicial Code; 2 Mason's U. S. Code Annot. Title 28, ch. 9, sec. 347; 43 St. L. 938.)

Much space is taken up in the bill with a voluminous and meticulous description of the administrative system of water distribution in the state of Colorado; it is asserted that if the defendant, the Water Users Association, as plaintiff below, shall succeed in procuring a judgment of priority that it will disrupt and destroy the whole administrative system of distributing water for irrigation in

the state of Colorado. There is no ground for this statement. Every appropriation in Colorado as against every other appropriation has a decreed right fixed in the local court having jurisdiction. This decree fixes the date of priority, and the amount of water to which the appropriator is entitled. The state engineer and the district officers having charge of the distribution have before them a list of these priorities by which they are entirely governed.

No administrative rule or any other authority can change the imperative direction of this adjudication: A is entitled to 100 second-feet by a priority of say 1881; B is entitled to 100 second-feet by a priority of 1882, the needs of A must be satisfied before B can have any water, and so on down the line. If by a later adjudication some other party secures a priority above both A and B then A and B must wait until that priority is satisfied. If this third party is adjudicated a priority later than A and earlier than B then they must be satisfied in that order. So in this particular case if the United States District Court for the District of Colorado determines that the Finney County Water Users Association has a priority superior to all of the defendants, none of these defendants can take water from the Arkansas river until the needs of the Water Users Association have been satisfied; they will be enjoined from diverting water until the decree has been complied with. If they refuse to obey the judgment, if they undertake to divert the water out of time and to the injury of the Water Users Association, they are subject to punishment for contempt. The Water Users' Association will be satisfied with a decree of the United States District Court for Colorado fixing its priority, and will undertake to enforce that priority as against the defendants by the process of the Federal District Court.

This Court has decided against a similar contention.

In the case of *Ex parte New York*, 256 U. S. 490, 502, 503, 65 L. Ed. 1057, 1063, this Court had to consider a similar contention where there was an application for a writ of prohibition to forbid the Court below from moving in an admiralty matter. And the Court said:

> "There is no substance in the contention that this result enables the state of New York to impose its local law upon the admiralty jurisdiction, to the detriment of the characteristic symmetry and uniformity of the rules of maritime law."

So there is no more difficulty or disturbance in intruding in the list of priorities among the water users of the state of Colorado a decree of the Federal Court than there would be in the intrusion of an adjudication of the same kind by the state court.

But suppose that the state of Kansas were to renew its suit against Colorado for a reasonable share of the flow of the water of the Arkansas river, and this court should adjudge to it one third or one-fourth of the flow, how would this court determine who among the Colorado irrigators should lose this water in order to obey the decree?

In such case, if the rights of Kansas were decreed to be superior to those of some, but inferior to those of others, of the Colorado users, the administration of the use of water by the Colorado officials would have to be adjusted to the provisions of the decree. Such an adjustment can as well be made pursuant to the decrees in the two suits in the United States District Court in Colorado.

The allegation at the close of paragraph twelfth of the bill, that the Finney County Water-Users Association, in its cases brought in the United States District Court in Colorado, will cause to be adjudicated the relative rights of the states of Colorado and Kansas in the benefits of the Arkansas river as a whole, require to be read in connection with the allegations in paragraph twelfth that questions

of priorities are presented in these cases, and with the allegations in paragraphs twelfth, fourteenth and fifteenth that adjudication in these cases would disrupt the administration by Colorado of water rights, and such allegation at the close of paragraph twelfth can mean nothing more, in view of the other allegations in the bill.

In paragraph 6 on page 12 *et seq.* of the bill, there is a long citation from the constitution, laws and decisions of Colorado, from which counsel for the complainant contend that Colorado as a sovereign state has rightfully adopted the policy of absolute control and exclusive use of the flow of the Arkansas river because it arises in that state. In support of that contention it cites *Hudson Water Company v. McCarter*, 209 U. S. 349, 52 L. Ed. 828. In that case the plaintiff in error, defendant below, was charged with violating a law of the state of New Jersey which forbade the fresh waters of that state to be diverted into some other state; the defendant had contracted to take the waters of the Passaic river from their natural flow and course and deliver them in Staten Island in the state of New York. The court upheld the New Jersey statute, as a proper exercise of the police power of the state, and decided against the plaintiff in error.

What application that has to the rights of the state of Kansas to the flow of the Arkansas river in its regular accustomed bed we do not understand. Perhaps counsel will enlighten us in their brief.

But there is a curious inconsistency in the contentions set forth on these pages with other parts of the bill. In one place counsel say that Colorado has the right to take and use all the flow of the Arkansas river as against the lower riparians. In another place they admit that *Kansas v. Colorado* established a comity between the two states by which Colorado can only make a reasonable use of the water, and that each state has a right to an equitable share in its

flow. Which of these two doctrines they intend to stand upon we hope they will inform the Court in their brief.

On page 27 *et seq.* there is a reference to the settlement of the case of the U. S. Irrigating Company against the same defendants impleaded in the case of *The Water Users Association v. The Graham Ditch Company et al.* We fail to see the relevance of this allusion to the issues here. If it indicates anything it indicates that one appropriator in Kansas controlling three ditches (instead of two as stated in the bill) had obtained a satisfactory settlement of its litigation, a final settlement which bars it from any future litigation and removes it from the category of those in Kansas who are threatening to bring suits. To that extent it defeats the purpose of their bill.

On page 40 *et. seq.*, counsel refer to the fact that the state of Colorado is an appropriator upon the Arkansas river and some of its tributaries and that the Water Users Association has not made the state a party defendant. We submit that this is a matter for the attention of the Federal Court of Colorado where these suits are pending.

If the Water Users Association chooses not to engage in a controversy with the state of Colorado it seems to us that that is its own affair.

It is also alleged that there are a considerable number of municipalities taking water from the Arkansas river and its tributaries that are not impleaded. The Water Users Association is not asking a priority as against the use of water for domestic purposes necessary to the health of the inhabitants of Colorado, wherein it is more generous than the Colorado irrigators are with the riparian municipalities on the Arkansas river in Kansas.

Counsel devote considerable space to a description of the civilization and prosperity that had been built up along the Arkansas river

in Colorado by means of its irrigation. We have watched the growth of this prosperity with admiration, mingled with distress, because its growth has been at the expense of the irrigators of western Kansas. Kansas had an irrigation law before Colorado was a state; all of its larger ditches, including the one owned by the defendant Water Users Association, were begun within four years after Colorado became a state, before there was any irrigation practiced in Colorado except on a small scale, and irrigation was a complete success in western Kansas. Within five or six years settlement increased rapidly, lands were taken up, put under water, with productive results, and we had a budding, growing civilization and prosperity that would have equaled that of Colorado except for the taking by the latter of the water upon which the prosperity of the irrigators along the Arkansas river in western Kansas depended. The Colorado people, seeing the success of irrigation in Kansas, adopted it, and being above the Kansas irrigators on the river were able to deprive them of the water that they had appropriated, and have used it in derogation of their rights for over forty years and thus built up this industry and wealth in Colorado. It has been built up at the expense of the lower irrigators in Kansas, in derogation of their rights, contrary to law, and in the face of a long course of decisions adverse to the claims of the Colorado irrigators, beginning with *Hoge v. Eaton*, 135 Fed. 411. Having thus deprived the Kansas irrigators of their rights and thereby obtained vast benefits, Colorado, counseled by the Colorado irrigators, now pleads these benefits in justification of the wrong.

An attempt is made to show the vast difference in soil and climate between the irrigated country along the Arkansas in eastern Colorado and the country irrigated, or attempted to be irrigated, in western Kansas. Of course there is no perceptible difference; no one crossing from Colorado into Kansas can notice the slightest

change in soil or climate. The change is so imperceptible from Pueblo to Dodge City that it cannot be noted. There is a slight increase in the rainfall as we proceed eastwardly, but nowhere between the Kansas line and at least eastern line of Finney county is dry farming profitable, nor can field crops be grown profitably without irrigation save in exceptional years of rare occurrence.

Irrigation in Colorado and Kansas is pursued by exactly the same methods and produces exactly the same results whenever the irrigators in Kansas get the water that is their due.

The Effect of the Decision in Kansas v. Colorado.

Running through the bill of complaint there are numerous allegations to the general effect that the Finney County Water Users Association cannot maintain the two suits described in the bill in the Federal Court of Colorado to assert its priority, because under the decision in *Kansas v. Colorado* no one but the state of Kansas can maintain any action regarding the flow of the Arkansas river or to prevent its diversion in Colorado. This is repeated over and over again. Indeed, counsel go so far as to say that the decision in *Kansas v. Colorado* dismissing the bill with leave to the complainant to renew the action, was in effect a decree quieting in Colorado and its citizens who are diverting the water of the Arkansas absolute and complete title to all of the water then being diverted at the time of the decree. In other words, that in this suit where the bill was dismissed without prejudice, the dismissal quieted in the appropriators title to all of the water then appropriated and diverted within the state of Colorado. We shall waste no time arguing that question; but if this contention be true, if none but the state of Kansas can assert a right to the flow of the Arkansas river within that state, then the defendant, the Finney County Water Users Association, has no right to sue, no standing in the Federal Court of Colo-

rado, and that Court has no jurisdiction, and indeed that is the plain contention of counsel, that the Federal Court has no jurisdiction of these two suits complained of. Certainly such allegations are not pertinent to a bill of peace. It is not the object and purpose of a bill of peace to enjoin suits of which the court has no jurisdiction, pending or threatened, but to take jurisdiction of numerous suits, vexatious or otherwise, to prevent multiplicity and settle all the rights. These allegations of lack of jurisdiction in the lower court might be pertinent in an application for a writ of prohibition under some circumstances, but generally the superior court will not grant a writ of prohibition on that ground where the complaining litigant can reach the superior court, the final court, by appeal or certiorari, although a writ has issued under such circumstances.

We are again puzzled as to what relief counsel really desire, but since, as it seems to us, they have utterly mistaken and misstated the whole effect of the decision in *Kansas v. Colorado*, we shall briefly examine the case. The case it too familiar to require any citation from it. Mr. Justice Brewer's statement of the case is sufficient for our purpose. The bill alleged that the state of Kansas was a large landowner of lands riparian to the Arkansas; that the entire valley of the Arkansas in Kansas, covering some 350 miles in length, varying from two to twenty-five miles in width, is underlaid with an "underflow," not percolating water in the ordinary sense, but a distinct body of water beneath the surface moving in a slow, continuous stream following the course of the surface river. That this underflow produced a subirrigation making it possible to raise crops on the bottom lands with but little rainfall, and that it was of immense value to the territory comprising from three to four thousand square miles; that the state of Colorado and its citizens, by so diverting the water of the Arkansas river in Colorado preventing

any of it but an occasional flood from crossing the state line, had so lowered this underflow—five feet it was charged—that it had ceased to be of any value for subirrigation; that as a result these lands which had been formerly valuable had almost lost their productive qualities and become nearly valueless. It was also further alleged that the riparian landowners on the river had been deprived of the use of the water for domestic purposes; that the towns and cities along the river had been deprived of the use of their water supply, thus impairing the health of the citizens of these towns and cities; that by reason of this deprivation the taxable value of these lands had been greatly diminished to the loss of the state of Kansas as a whole, and it was alleged that certain irrigators in the western part of the state had been deprived of the flow of water for their ditches. These ditches were not described, but were simply mentioned in a general way. The amount of irrigated land covered by them was about 40,000 acres as compared with some four million acres affected by the underflow.

Indeed the loss of the underflow was the gravamen of the whole bill. Having thus described the nature of the complaint Mr. Justice Brewer repeated several times in his opinion that this was a suit between states, the state of Kansas suing not only in its individual right as a riparian landowner but as *parens patriæ* and guardian for all the people of Kansas who were more or less directly injured by the wrongful acts of Colorado. He said that the wrongful acts were charged to be the acts of the state of Colorado through agencies that it had created. The effect of the decision so far as it declared that each state was entitled to an equitable share of the flow of the river, was not to fix or affect any individual right, but to establish a comity between the states, and the decision established the right and interest of all of the people of the state of Kansas in

the flow of the river generally. It did not determine any question of priority of rights as between particular appropriators in Kansas and in Colorado.

The bill alleges that the decree of dismissal in *Kansas v. Colorado*, although not a final judgment, nevertheless was *res adjudicata* as to the rights of the defendant Water Users Association and precludes it from maintaining these individual suits against individual irrigators. This contention is settled by this Court in *Brandon v. Ard*, 211 U. S. 11, 23, 53 L. Ed. 68. In that case certain settlers formed an association, procured a suit to be brought by the government against the railway company to cancel certain orders that had been issued withdrawing lands from preemption or homestead settlement. It was held that the decision in that suit did not bind a homestead claimant who was not a party to the suit, although he had been active in procuring the institution of the action by the government. The Court said: (p. 23.)

> "Ard was not, and was not sought to be, made a party to that action. He had no control of it, and was not entitled of right to be heard or to adduce evidence in it. He was not, in any legal sense, represented in the case, nor can he be regarded as privy to the issue between the United States and those whom it sued. His membership in the Settlers' Protective Association—which association, it is said, induced the United States to bring the action referred to—did not so connect him, in law, with the litigation, as that the judgment therein would bind him or be conclusive evidence against him. It must be assumed that the Attorney-general of the United States sued the Missouri-Kansas Company only in the discharge of his official duty, and for the purpose of asserting the rights of the government as against that company. He could not have represented merely private parties in that suit; he represented only the United States."

According to the allegations of the bill the defendant Water Users Association claims a priority as of 1880; that at that time it had

commenced and had ever since continued the beneficial appropriation of water from the Arkansas river in Kansas. When the suit of *Kansas v. Colorado* was brought this right had vested for twenty-three years. We submit that the defendant cannot be deprived of this right by a suit between the two states to which the defendant was not a party, over which he had no control, in which his rights were never set up, described or mentioned, except as a right in common, more or less, with all other citizens of the state; to hold thus would be to deprive this defendant of its vested rights without its day in court; without due process or any kind of process of law.

The Federal Courts Have Uniformly Upheld the Rights of Private Appropriators to Assert Their Priorities Regardless of State Lines.

We assume from the general tenor of the bill of complaint that counsel will raise here many of the same questions that were raised in the Court below in the two cases complained of and will make substantially the same argument there made on their motions to dismiss, which were overruled.

The case of *Wyoming v. Colorado*, 259 U. S. 419, settled definitely and finally that priority of appropriation, where the right to appropriate water for irrigation is recognized, is not affected by political divisions or state lines; an interstate river is treated as a whole; the rights of prior appropriators, lower state against other appropriators in the upper state, are exactly the same as though all the appropriators were within one state. That was a contest between two states. It was immediately followed by *Weiland v. Pioneer Irrigation Company*, 259 U. S. 498, 66 L. Ed. 1027, a case involving the right of an appropriator, a Nebraska corporation using the water in Nebraska, to assert its rights against later appropriators in the state of Colorado. The Court followed the decision of *Wyoming v. Colo-*

rado, applied it to the right of this private corporation and granted the irrigating company the relief prayed for. To avoid the force of these two decisions counsel for the defendants in the Court below maintained that the decisions which we cited covering disputes between irrigators on a stream partly in Nevada and partly in California; on a stream partly in Montana and partly in Wyoming and in the Pioneer Irrigating Company case, were disputes between irrigators in different states whose laws were exactly similar; states all of which recognized the arid states doctrine, the doctrine of strict prior appropriation; that the state of Kansas had never recognized the right to appropriate water for irrigation; that it held strictly to the common law doctrine, and therefore the cases which were there cited and which we now cite could not apply as between the Kansas plaintiffs and the Colorado defendants.

We are thus compelled to briefly note the statutes and decisions of these states: *Miller and Lux v. Rickey, &c., Co.,* 137 Fed. 573, an early and much quoted case, was a dispute over the waters of the Walker river, which rises in the state of California and flows across the boundary line into Nevada; the plaintiffs using the water for irrigation purposes in Nevada, brought suit in the Federal Court in Nevada against the defendants, alleging that they were diverting water in the state of California by dams and ditches for irrigation purposes to the detriment of plaintiffs' rights in Nevada. The Federal Court took jurisdiction, decided in favor of the Nevada claimants, wholly disregarded the state line, and wholly disregarded the fact that the laws of the two states as to water rights were entirely different, as we shall show, and the decision was affirmed in *Rickey, &c., Co. v. Miller and Lux,* 218 U. S. 258, 54 L. Ed. 1032. The law of Nevada is the arid states law of strict prior appropriation; the California law was first defined in *Lux v. Haggin,* 69 Cal.

255; the decision necessitated a special session of the California legislature. It was said in the syllabus:

> "1. A private corporation cannot divert the waters of a watercourse and thereby deprive the riparian proprietors of all use of the same without compensation made or tendered to such proprietors.
>
> "2. The owner of land by or through which a watercourse naturally and usually flows have a right of property of the water in the stream."

The Court will observe that this is the common-law doctrine of riparian rights. This was the doctrine applied in *Katz v. Walkinshaw*, 141 Cal. 117, as to percolating water. 4 Kinney on Irrigation, 2d ed., sec. 1726.

So this was a suit where there was the arid-states law of strict prior appropriation in Nevada and the common law or riparian system in California.

In *Bean v. Morris*, 221 U. S. 485, 55 L. Ed. 821, Morris, in Wyoming, had appropriated the waters in Sage creek. He brought suit against a junior appropriator in Montana. The sole question was whether such an action could be maintained by a citizen of Wyoming against a junior appropriator in Montana; the lower court gave Morris a priority of one hundred miners' inches as against the appropriator in Montana. This Court said that the sole question was whether this right of appropriation could be maintained by the Wyoming appropriator against the Montana appropriator, regardless of the state line, and held that it could. Wyoming is of course a strict prior-appropriation state. The law of Montana is fully set forth in Kinney on Irrigation, 2d ed., vol. 4, sec. 1880, and also in *Smith v. Denniff*, 24 Mont. 20. Montana recognizes the right of the riparian owner to the use of the water flowing by his land to the extent which he uses it and he cannot be deprived of the use of the water by appropriation for irrigation without compensation. In

short the law of Montana is a hybrid appropriation grafted on to the common law, but it is not in anywise a prior appropriation system such as Wyoming and Colorado. Nebraska has also a hybrid system which is fully discussed in Kinney on Irrigation, vol. 4, second edition, section 1899, in which he states that in Nebraska as in Colorado—

> "That the two doctrines of water rights, one the right of a riparian appropriator and the other the right of appropriation and application of the water to a beneficial use by a nonriparian owner, exist concurrently in the state."

The right of the riparian owner to the flow of the stream is a right inseparably annexed to the soil as a part and parcel of the land, but this right may be divested for irrigation by the exercise of the power of eminent domain and the payment of damages. The doctrine is fully covered by the decision of the Nebraska court in *Crawford County v. Hathaway*, 67 Neb. 325, 93 N. W. 781, so that the decision in the Pioneer Ditch case was not between two states having the same doctrine as to the water right, but between two states having completely diverse systems.

We turn now to the Kansas law; in General Statutes of Kansas, 1868, chapter 23, article 2, section 5 (page 192), in enumerating the objects for which corporations might be organized, in the thirty-fourth paragraph it was said:

> "The construction and maintenance of canals for the purposes of irrigation or manufacturing purposes."

Section 89 of the same chapter gave to irrigation corporations the right to eminent domain for their canals, the right to construct the same and to furnish water for irrigation for pay.

In 1872 this statute was slightly amended and reënacted by chapter 105, Laws of Kansas, 1872. In 1876, chapter 58, Laws of Kansas, 1876, there was a provision for the appropriation of lands by

irrigation corporations, granting them power to take so much water from a stream as might be necessary for their purposes; provided, however, that it should be unlawful "to take and use the waters of any stream in such manner as to interfere with or in anywise hinder, delay or injure any milling or irrigation improvements already constructed, *or to diminish the supply of water flowing to or through any established irrigation canal.*"

This is a clear recognition of the right of prior appropriation, although not using the exact language used in the arid states; but it recognizes the right to appropriate water, and it clearly recognizes *that first in time is first in right*, and that a subsequent appropriator cannot divert water to the injury or deprivation of the prior appropriator, and this law took effect before Colorado became a state. This statute has never been amended or repealed, and is still in force as Revised Statutes of 1923, secs. 13-606 and 13-608.

By chapter 115, Laws of Kansas, 1886, the full doctrine of prior appropriation was adopted as follows:

> "The right to the use of running water flowing in a river or stream in this state for the purpose of irrigation may be acquired by appropriation as between the appropriators, *and the one first in time is the one first in right.*"

The act also contains very full provisions as to the manner of appropriation, posting the notice and so on. It also legalizes the right of way of canal companies which had been constructed two years prior to January 1, 1886; this, however, was unnecessary. It also provided that any company that had constructed a canal, ditch or flume for purposes of irrigation more than five years prior to that time should have title by prescription. This would cover the ditch of the Finney County Water Users Association which was commenced in 1880. In 1889, by chapter 165, Laws of Kansas, 1889, irrigation ditch and canal companies were given the right of emi-

nent domain. In 1891, by chapter 133, Laws of Kansas, 1891, it was provided that in all that portion of the state of Kansas situated west of the ninety-ninth meridian, comprising more than one-third of the state, all natural water, whether standing or running, whether surface or subterranean, is devoted first to the purposes of irrigation, in aid of agriculture, subject to ordinary domestic uses. In 1899, chapter 95, Laws of Kansas, 1899, authorized the appropriation of lands for irrigation purposes, and chapter 151 reauthorized the condemnation of lands for irrigation canals and reservoirs. In 1895, by chapter 155, Laws of Kansas, 1895, a Board of Irrigation was created, and authorized to make experiments.

It will be observed, then, that Kansas has had ten statutes, commencing in 1868, recognizing the use of water for irrigation and the right of prior appropriation, and in every essential detail protecting the irrigator as fully as do the laws of Colorado and Wyoming.

Under the existing statutes of Kansas the subject of appropriation and use of water for irrigation is extensively covered.

Corporations may be organized to contract and maintain dams and canals for irrigation. (Clause 37, sec. 17-202, Revised Statutes of Kansas, 1923.)

The right may be condemned to take water for purposes of irrigation. (Sections 42-109 to 42-118, *id.*)

The right of way may be condemned to construct and maintain canal ditches and sluices for irrigation. (Section 42-120, *id.*)

The same as to works and canals for irrigation. (Sections 42-316 and 42-317, *id.*)

The appropriation and use of water for irrigation is authorized and regulated. (Sections 42-101 to 42-108; sections 42-120 to 42-122; sections 42-301 to 42-304; sections 42-310 to 42-315; sections 42-321 to 42-3111, *id.*)

Referring to section 42-301, *id.*, which authorizes the appropriation of water for the purposes of irrigation west of the ninety-ninth meridian, the following counties in Kansas, through which runs the Arkansas river, are situate west of that meridian, beginning at the west line of the state: Hamilton, Kearny, Finney, Gray, Ford, Edwards and Pawnee.

The opinion in *Kansas v. Colorado* is erroneous in so far as it says that Kansas is a strict riparian-rights state, and the Court undoubtedly fell into that error by following the syllabi in *Clark v. Allaman*, 71 Kan. 206, which held that prior to 1886 Kansas was a strictly common-law state and the right of irrigation was not recognized. Evidently in *Clark v. Allaman* neither the Court nor the counsel who briefed the case had noticed the earlier statutes which we have cited and which were still in full force and effect at that time. The controversy in *Clark v. Allaman*, however, was simply between a riparian owner whose rights to the flow of the stream had vested prior to the time of the claimed appropriation, and the Court held that the riparian right was superior to the subsequent right of irrigation. The Court ignored the fact that in the same year that the common law was continued, 1868, there was in the same volume conclusive statutory recognition of the right of irrigation, which to that extent repealed the common law as it existed in England and the Eastern states. For sixty years Kansas has recognized the right of irrigation, the right of appropriation, the right of priority, and the defendant Water Users Association having acquired its rights under these statutes can assert them as against the subsequent appropriators in Colorado. It appears, then, that in upholding the rights of priority for irrigation in California, in Montana and in Nebraska, this Court has paid but little attention to whether the systems in the two states were similar or conflicting. This is particularly true in the case of *Rickey, &c., Co. v. Miller and Lux.* But

if it is to be the criterion, then we have shown that Kansas adopted irrigation before Colorado became a state.

We assume of course that there will be no question that this Court, as a federal court, will take judicial notice of all of the statutes that we have cited.

In Conclusion.

We contend that the bill of complaint is wholly lacking in equity. That considered as a bill of peace it is fatally defective because—

(*a*) It does not allege that the state of Kansas threatens or intends to begin any suit of any kind concerning the flow of the Arkansas river.

(*b*) Because it does not allege that any party other than the Finney County Water Users Association threatens or intends to begin any suit similar to those now pending in the Federal Court of Colorado or assert any other kind of a right in the flow of the Arkansas river.

(*c*) Because the bill contains no information upon which the Court could implead parties interested in the controversies described or so that the Court may determine whether their rights of action are such that this Court could take jurisdiction of all of the supposed controversies and settle all of them by one decree.

(*d*) Because the complainant seeks to enjoin the Finney County Water Users Association from pursuing a claimed right in the Federal Court of Colorado, without affording it any relief in this or any other Court.

Because the state of Colorado is not a proper party complainant; has no interest in the subject matter of the suits pending in the Federal Court of Colorado other or different from that which it has in any litigation between citizens of Colorado and citizens of other states, which might be determined adversely to the citizens of Colorado.

Because this Court did not decide in the case of *Kansas v. Colorado* that none but the state of Kansas can maintain an action concerning the flow of the Arkansas river, and that such suit could only be brought in this Court. That decision did not attempt to determine any private vested rights in the flow of the river acquired by appropriation under and protected by the laws of the state of Kansas, which are being asserted in the suits described; and would not have deprived the Finney County Water Users Association of its vested right without due process of law.

Because the bill is so vague, uncertain and contradictory in its language that this Court cannot determine what relief the complainant seeks, or upon what specific ground it prays for relief.

That if the bill is an attempt, as some of its allegations would indicate, to prohibit the United States District Court for the District of Colorado from proceeding further with the suits described for lack of jurisdiction, it is fatally defective in form and discloses in the complainant no right to such relief.

It is therefore respectfully submitted that the bill of complainant should be dismissed.

Respectfully submitted,

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation, Defendants.

□

FILE COPY

Office Supreme Court, U. S.
FILED
AUG 23 1928

In the Supreme Court
of the United States.

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

REPLY BRIEF FOR DEFENDANTS
ON THEIR MOTION TO DISMISS THE BILL OF COMPLAINT IN EQUITY AND THE CASE.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.
F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

12-4237

INDEX.

PAGE

Outline of Topics and list of cases under each Topic 3
The Nature of the Bill 4
Position of the State of Kansas 4
Position of the Finney County Water Users' Association 6
The Controversies in the District Court are of a Private Nature .. 13
Conclusion 18

Cases Cited:

Georgia v. Tennessee Copper Co., 206 U. S. 230; 51 L. Ed. 1038 16
Kansas v. Colorado, 185 U. S. 125; 46 L. Ed. 838 ..... 9, 15
Kansas v. Colorado, 206 U. S. 46; 51 L. Ed. 956 ..... 9, 15
Kansas v. U. S., 204 U. S. 331, 340, 341; 51 L. Ed. 510, 512, 513 15
Louisiana v. Texas, 176 U. S. 1, 22; 44 L. Ed. 347, 356 14, 15
Missouri v. Illinois, 180 U. S. 208; 45 L. Ed. 497 16
Missouri v. Illinois, 200 U. S. 496; 50 L. Ed. 572 ..... 5, 16
New Hampshire v. Louisiana, 108 U. S. 76; 27 L. Ed. 656 ... 15
New York v. New Jersey, 256 U. S. 296, 309; 65 L. Ed. 937, 943 ..... 5, 16
North Dakota v. Minnesota, 263 U. S. 365, 374; 68 L. Ed. 342, 346 ..... 5, 15, 16
Oklahoma v. Atchison T. & S. F. R. Co., 220 U. S. 277, 287, 288; 55 L. Ed. 465, 468, 469 15
Weiland v. Pioneer Irrigating Co., 259 U. S. 498; 66 L. Ed. 1027 12
Wyoming v. Colorado, 259 U. S. 419; 66 L. Ed. 999 ... 12, 16

In the Supreme Court
of the United States.

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

REPLY BRIEF FOR DEFENDANTS
ON THEIR MOTION TO DISMISS THE BILL OF COMPLAINT IN EQUITY AND THE CASE.

Topics.

WHAT REMEDY?

POSITION OF THE STATE OF KANSAS.

The extent of the burden upon Colorado.

North Dakota v. Minnesota, 263 U. S. 365, 374, 68 L. Ed. 342, 346.

New York v. New Jersey, 256 U. S. 296, 309, 65 L. Ed. 937, 943.

Missouri v. Illinois, 200 U. S. 496, 50 L. Ed. 572.

POSITION OF THE FINNEY COUNTY WATER USERS' ASSOCIATION.

Priorities of rights of water appropriators extend across a state line.

Weiland v. Pioneer Irrigating Co., 259 U. S. 498, 66 L. Ed. 1027.

Wyoming v. Colorado, 259 U. S. 419, 66 L. Ed. 999.

THE TWO SUITS IN THE DISTRICT COURT PRESENT CONTROVERSIES OF A PRIVATE NATURE OF WHICH THIS COURT SHOULD NOT TAKE JURISDICTION IN THIS ORIGINAL CASE.

New Hampshire v. Louisiana, 108 U. S. 76, 27 L. Ed. 656.
Louisiana v. Texas, 176 U. S. 1, 22, 44 L. Ed. 347, 356.
Kansas v. U. S., 204 U. S. 331, 340, 341, 51 L. Ed. 510, 512, 513.
Oklahoma v. Atchison T. & S. F. R. Co., 220 U. S. 277, 287, 288, 55 L. Ed. 465, 468, 469.
North Dakota v. Minnesota, 263 U. S. 365, 374, 375, 376, 68 L. Ed. 342, 346.

Cases Distinguished:

Kansas v. Colorado, 185 U. S. 125, 46 L. Ed. 838, and 206 U. S. 46, 51 L. Ed. 956.
Missouri v. Illinois, 180 U. S. 208, 45 L. Ed. 497, and 200 U. S. 496, 50 L. Ed. 572.
Georgia v. Tennessee Copper Co., 206 U. S. 230, 51 L. Ed. 1038.
New York v. New Jersey, 256 U. S. 296, 65 L. Ed. 937.
Wyoming v. Colorado, 259 U. S. 419, 66 L. Ed. 999.
North Dakota v. Minnesota, 263 U. S. 365, 374, 375, 376, 68 L. Ed. 342, 346.

Conclusion.

What Remedy?

In our opening brief we challenged the bill of complaint as a bill of peace. We showed, we think, conclusively that it is not a bill of peace, for the reasons there set forth. Upon this subject counsel in their lengthy brief are entirely silent. They nowhere answer our contention, nor even mention it. They cite no authorities and present no argument to sustain their pleading as a bill of peace. By their silence they concede that it is not and that they cannot have an injunction against the defendants on that ground.

Position of the State of Kansas.

Since, then, the complaint is not a bill of peace, what remedy can the complainant have against the State of Kansas? It cannot have prohibition, because the State of Kansas is not in court anywhere, and prohibition will not lie except against a litigant who is actually

in court endeavoring to enforce some right; in a court that is without jurisdiction of the cause, and then only under certain circumstances. Further than that, nowhere in the complaint is there any allegation that the State of Kansas threatens or intends to bring any suit against the State of Colorado or any of its citizens connected with the flow of the Arkansas river. Nowhere in their brief do counsel assert that there is any such allegation in their complaint or any such intention on the part of the State of Kansas.

It seems perfectly clear, then, that for these two reasons the case must be dismissed as to the State of Kansas. There is no allegation in the complaint that makes it a proper party here; it threatens no injury to the State of Colorado or any of its citizens. This being true, the bill could not be maintained against it even if it were in any sense a bill of peace. It cannot be maintained as an application for prohibition, because the state is not in court. At the outset, then, the State of Kansas must be dismissed.

In *North Dakota v. Minnesota*, 263 U. S. 365, 374, 68 L. Ed. 342, 346, it was said:

"The burden of the complainant state of sustaining the allegations of its complaint is much greater than that imposed upon a complainant in an ordinary suit between private parties."

In *New York v. New Jersey*, 256 U. S. 296, 309, 65 L. Ed. 937, 943, it was said:

"Before this court can be moved to exercise its extraordinary power under the constitution to control the conduct of one state at the suit of another, the threatened invasion of rights must be of serious magnitude, and it must be established by clear and convincing evidence."

Citing *Missouri v. Illinois*, 200 U. S. 496, 50 L. Ed. 572.

Here the complainant invokes the jurisdiction of the court to control the actions of another sovereign state, draws it into court to defend itself upon a bill of complaint which states no cause of action

and in which complainant's counsel confess that they do not know what relief they want or what relief, if any, is warranted by their bill—a most extraordinary and curious proceeding. And this brings us to the consideration of—

The Position of the Finney County Water Users' Association.

In considering this lengthy complaint and the opposing brief we are in danger of overlooking the fundamental basic facts as to the defendant, the Water Users' Association. These facts are:

(*a*) That the predecessor in interest of the Water Users' Association in 1880 constructed the canal now owned by this defendant, turned the water of the Arkansas river into it, and that the canal has ever since been used for irrigating purposes; has never been abandoned, and that association has put the water of the Arkansas river at its headgates to beneficial use whenever it could be obtained from the flow of the river.

(*b*) That this right was acquired under the laws of the State of Kansas which recognized the right to appropriate water for irrigation purposes and it has been repeatedly and continuously recognized by various statutes of the State of Kansas.

(*c*) This right is a legal right, not arising in dignity to a fee title to real estate, because the right may be lost by abandonment, but it is an exclusive possessory right—a legal right, not a mere equitable interest—and may be protected with as much certainty as a title to real estate (Kinney on Irrigation, second edition, volume 2, page 1318).

(*d*) That from the time the ditch was opened and the water put to beneficial use it was a prosperous and growing enterprise; the lands under it were speedily taken up, put into cultivation and large and profitable crops grown by irrigation. This condition continued

for about ten or fifteen years, until citizens in Colorado, seeing the success of irrigation in Kansas, began to construct canals and divert the water of the Arkansas river, and eventually there came a time when they had diverted all of the ordinary flow of the river in Colorado, so that none of it came to the headgates of the defendant association's ditch, and it has been compelled to rely upon occasional or seasonal flood water.

(c) That the appropriation of this defendant association was prior in time and is superior in right to all of the appropriations of the citizens of Colorado named as defendants in the two cases of the *Finney County Water Users Association v. Graham Ditch Company et al.* and *The Same v. Coler Ditch Company et al.*

These facts are all alleged in the two bills of complaint in the cases pending in the federal court of Colorado referred to and described in the complaint. These facts were abundantly proven by the testimony taken by this defendant in the first case against the Graham Ditch Company. Here, then, was a right vested in the Finney County Water Users' Association in 1880 and continuously held, asserted and maintained by it since that time. It was a right twenty-one years old when the suit of *The State of Kansas v. The State of Colorado* was commenced. It was twenty-six years old when it was decided; at the present moment it is forty-eight years old.

There is another basic and important fact disclosed by the complaint—that the United States Irrigating Company, owning the other three ditches and the only other ditches in Kansas, brought a suit against the same defendants that are impleaded in the Graham Ditch Company case and made settlement. In this settlement these three ditches took a priority as against the Colorado appropriators of August, 1910, in full satisfaction of all of their rights and claims in the matter. So that the Finney County Water Users' Association

is to-day the only irrigating ditch in Kansas on the Arkansas river that can bring or maintain any suit against appropriators in Colorado.

As remarked before, this suit cannot be maintained as a bill of peace. There is, owever, a tenuous and sometimes disappearing thread of argument running through the complaint (much of which is argumentative) and brief to the effect that the United States District Court for the District of Colorado has no jurisdiction of the two cases described, because the Finney County Water Users' Association cannot maintain its action or assert its right as a prior appropriator.

To uphold this contention they argue that it was decided in *Kansas v. Colorado* that none but the State of Kansas can maintain any action against the citizens of Colorado for deprivation of the flow of the Arkansas river. They approach this statement with great circumspection, but it is repeated in various forms many times, and it is the only foundation, if any, they have to maintain this action in this court. It is apparent that if the Water Users' Association has a right to bring its suit in the federal court of Colorado the question whether the suit is well founded or without merit is for that court.

If the purpose of this suit is prohibition, that result can only be obtained by challenging the jurisdiction of the federal court below. To make out any cause of action here they must convince this court that the decision in *Kansas v. Colorado* was as they contend and that as one of the effects of the decision the Finney County Water Users' Association was outlawed from any remedy to protect its right, which had been vested for a quarter of a century when that suit was decided.

It is not contended that the Water Users' Association was a party to the suit of *Kansas v. Colorado*.

There is a significant paragraph in the opinion on the demurrer in *Kansas v. Colorado*, 185 U. S. 125, where at the close of the opinion Chief Justice FULLER said that proof should be taken as to "whether certain persons, firms or corporations in Colorado must be made parties hereto."

In other words, the court intimated there that the rights of appropriators in Colorado who were diverting the flow of the river under the laws of that state could not be shut off unless they were made parties and had their day in court, and acting upon that hint or suggestion, the bill of the State of Kansas was amended and all of the appropriators then diverting water directly from the river in Colorado were made parties defendant, answered, filed briefs and participated in the argument.

The most cursory reading of the statement of the case of *Kansas v. Colorado* upon final hearing, 206 U. S. 46, will disclose that the suit was brought, not on behalf of any individual, but by the state for itself, in its proprietary right, owning certain lands riparian to the river in Kansas, and as *parens patriæ* for the benefit of all of the citizens of Kansas living in the valley of the Arkansas river. The damage claimed by the lowering of the underflow and consequent destruction of crops grown in the valley was to more than a million acres. It was claimed that the destruction of the flow of the Arkansas river was detrimental to the health of all of the inhabitants of the valley. The case was dismissed without prejudice and with leave to the State of Kansas to maintain another suit of the same character and for the same objects, because it was held that the complainant had not shown sufficient damage as alleged to itself as a riparian owner or to all the dwellers along the river in Kansas. It was shown that the irrigation ditches in Kansas served only about 40,000 acres, while damage was claimed generally to more than a million acres, and a great volume of testimony was

taken as to the nature and beneficial effects of the underflow. There are elaborate tables in the opinion showing the decline in wealth, production and population of the counties along the river which was charged to this lowering of the underflow.

At the very last of the opinion it is said:

"The influence of said diminution has been of perceptible injury to portions of Arkansas valley in Kansas, particularly those portions closest to the Colorado line."

That is to say, that portion of Kansas where irrigation is practiced.

The court thus recognized that the arid portion of Kansas, where crops can only be raised by irrigation and where these irrigation ditches are situated, is in a wholly different situation from the main part of the Arkansas valley. This deprivation had caused a peculiar injury to that portion of the state and to the Water Users' Association, putting the parties there in a class by themselves. If this court in *Kansas v. Colorado* had decided as opposing counsel contend, it would have been pure dictum; no such issue was raised by the pleadings; there is not a line or syllable in any of the briefs nor was there any of the arguments to the effect here contended for. Colorado had two defenses; one was that she had a right to retain and use all of the flow of the river; second that there was no underflow, and therefore there could be no damage to the residents of the Arkansas valley in Kansas. The court found that there was an underflow; that the citizens of the valley depending on this underflow had been injured to some extent, but not sufficiently to warrant an injunction against Colorado.

Again, if *Kansas v. Colorado* had decided, as here contended on behalf of Colorado, that the Water Users' Association cannot bring suit to protect its vested rights, and it should be, as the result, outlawed from the courts of the country, then that decision would be

void. It would be void as against collateral attack because this defendant was never in court and no such issue was ever raised. But we welcome this contention. We hope it will be met and decided by this court. However indefinitely stated by the complainant, it is sufficiently stated to challenge the attention of the court, and it is the only question worthy of consideration here. Sometime it must be decided by this court, because it has been raised in these cases in the court below, and if there defeated these defendants will undoubtedly seek admission to this court upon that question. The Water Users' Association has already expended a large amount of money in prosecuting these cases; it has taken its testimony; if this case is dismissed without deciding this issue the defendants will proceed to take their testimony, and whatever the result, that case undoubtedly will go to the Circuit Court of Appeals. If there is merit in the contention the Water Users' Association desires to know it now before it has been put to further expense. If it may not maintain its rights in the courts it wants to know it now, and stop the costs. It may be noted here that this long delay has been of great pecuniary loss to the Water Users' Association and of corresponding gain to the Colorado appropriators. Even the delay through two growing seasons caused by the institution of this case will produce a profit to the Colorado irrigators far in excess of the cost of all of this litigation.

The Finney County Water Users' Association desires a speedy determination of its rights, and we trust this court will decide upon its merits this question of its right to maintain its suits.

Counsel for complainant insist that no effective judgment can be rendered in the court below without making the State of Colorado a party, because the distribution of the water according to the various priorities in order of right is effected by certain state officers—the state engineer and others.

The Water Users' Association is in the lower court under well-know rules of irrigation law and under a practice long followed in every state that recognizes irrigation, to establish, fix and determine its priority of right to a certain amount of water from the Arkansas river as against all of the defendants whose rights it claims are inferior to its rights. That will be the nature of the decree if it succeeds. The court will establish that it is prior to A, B, C, etc., and possibly subsequent to others.

If when this decree is entered the defendants inferior to the Water Users' Association shall refuse to obey the decree, the federal court of Colorado has ample process to protect its judgment.

If the state engineer in regulating the flow of the Arkansas river ignores this decree, refuses to recognize it, he will be acting outside of the law; he will not be protected by the fact that he is an officer of the State of Colorado; by appropriate action he can be compelled to obey the law and the decree of the federal court without making the State of Colorado a party. All of this is so clear as to hardly need a statement. This was clearly and decisively held in *Weiland v. Pioneer Irrigating Company*, 259 U. S. 498, 66 L. Ed. 1027; where the defendant below was the state engineer of Colorado. The jurisdiction of the lower court was upheld, its decision affirmed, and the priority of right of the Nebraska appropriator confirmed, regardless of the state line.

The case of *Wyoming v. Colorado*, 259 U. S. 419, 66 L. Ed. 999, established in principle the right of the Water Users' Association to maintain its suits in the lower court for the establishment of its right of appropriation as paramount and superior to the appropriations by the defendants in Colorado, regardless of state lines. To that extent it was decisive in favor of the contentions of the Association.

The Two Suits in the District Court Present Controversies of a Private Nature of Which This Court Should Not Take Jurisdiction in This Original Case.

Neither the State of Kansas nor the State of Colorado was a party to the suit brought in the United States District court for Colorado by the United States Irrigating Company against various defendants, but which was settled. (Bill, subdivision *a*, paragraph 12, pp. 26-29.) Some water officers of the state had been made parties defendant, but upon their prayer the court dismissed the case against them and permitted it to be maintained against the other defendants. (Bill, p. 27.) There is no allegation in the bill that the State of Kansas maintained the prosecution of that suit.

Neither state is a party in the two suits brought in the same court by the Finney County Water Users' Association, a corporation of Kansas, to assert priority of rights to water flowing in the Arkansas river, as against various Colorado defendants. (Bill, subdivisions *b* and *c*, pp. 29-34.) There is no allegation in the bill that the State of Kansas maintained the prosecution of either of those two suits.

The first action by the Finney County Water Users' Association was filed on November 27, 1916. Motions of the defendants to dismiss, presenting objections to the jurisdiction of the court, were overruled, and the defendants answered. It is alleged in the bill that the court is about to require the defendants to present testimony in support of their claims. (Bill, p. 29.) It is a fact which will not be denied by opposing counsel that the plaintiff in that case has taken a large amount of testimony.

The second action by the Finney County Water Users' Association was filed on January 23, 1923. (Bill, p. 31.) On October 22, 1926, motions to dismiss, filed by the defendants, were overruled,

and on April 1, 1928, the answers of the appearing defendants were completed and filed. (Bill, p. 34.)

As neither state is a party to either of those two cases, no decree can be entered in them which can bind either state, and it must be presumed that the court will not undertake to enter any such decree.

There is no allegation in the bill that the State of Kansas has taken any action, or has threatened to take any action, to interfere in any way with the use of water from the Arkansas river by defendants in those two suits. It is essential to the jurisdiction of this court over the State of Kansas that such state should either have entered into an agreement with the State of Colorado, which the State of Kansas has violated, or has threatened to violate, or that the State of Kansas has committed or has threatened to commit some other legal wrong against the State of Colorado. There is no allegation in the bill of any such conduct by the State of Kansas.

The Finney County Water Users' Association brought the two suits to assert its rights to a priority of appropriation of the water flowing in the Arkansas river as against the Colorado defendants. It had a right to bring and prosecute a suit for such a purpose, and the District Court has held that it has such a right, and has overruled motions of the defendants questioning its jurisdiction.

In the case of *Louisiana v. Texas*, 176 U. S. 1, 22, 44 L. Ed. 347, 356, the court, speaking by Mr. Chief Justice Fuller, said:

"When there is no agreement whose breach might create it, a controversy between states does not arise unless the action complained of is state action, and acts of state officers in abuse or excess of their powers cannot be laid hold of as in themselves committing one state to a distinct collision with a sister state.

"In our judgment this bill does not set up facts which show that the state of Texas has so authorized or confirmed the alleged action of her health officer as to make it her own, or from which it neces-

sarily follows that the two states are in controversy within the meaning of the constitution."

The first paragraph of the foregoing statement was quoted with approval in the opinion of this court by Mr. Justice Harlan in *Oklahoma v. Atchison, T. & S. F. R. Co.*, 220 U. S. 277, 287, 288, 55 L. Ed. 465, 469.

The issue of priority of appropriation between the parties in those two cases can be tried and determined therein, and a decree of the court will bind the parties and can be enforced. The facts as to the claims of the defendants may be very different. Those cases have been conducted since November 27, 1916, and January 23, 1923, respectively, as private suits, and the defendants have had the usual opportunities of litigants to present their contentions. Being private suits, the State of Colorado has no right to maintain this action, or to here assert the contentions which the defendants in those cases have asserted, or can assert in the District Court.

New Hampshire v. Louisiana, 108 U. S. 76; 27 L. Ed. 656.
Louisiana v. Texas, 176 U. S. 1, 22, 44 L. Ed. 347, 356.
Kansas v. U. S., 204 U. S. 331, 340, 341, 51 L. Ed. 510, 512, 513.
Oklahoma v. Atchison, T. & S. F. R. Co., 220 U. S. 277, 287, 288, 55 L. Ed. 465, 468, 469.
North Dakota v. Minnesota, 263 U. S. 365, 374, 375, 376; 68 L. Ed. 342, 346.

The case of *Kansas v. Colorado*, 185 U. S. 125, 46 L. Ed. 838, and 206 U. S. 46, 51 L. Ed. 956, did not present any questions of relative priorities of appropriation between parties in Kansas and in Colorado. The State of Kansas claimed the right on its own behalf, and of its citizens resident in the Arkansas valley, to the substantially unimpaired flow of the water of the Arkansas river, both for use directly from the river and to percolate through the subsoil and furnish underground water for crops and for other uses throughout the valley. Colorado claimed the right to authorize the taking of all the flow of water for irrigation and other uses in Colorado. There

was no decree therein on the question of priorities of the appropriation, and the decree in that case cannot be *res adjudicata* in this case.

In the case of *Missouri v. Illinois*, 180 U. S. 208, 45 L. Ed. 497, and 200 U. S. 496, 50 L. Ed. 572; *Georgia v. Tennessee Copper Co.*, 206 U. S. 230, 51 L. Ed. 1038; *New York v. New Jersey* and *North Dakota v. Minnesota*, supra, the action of the defendant state created a public nuisance as against the citizens of the complaining state, and jurisdiction of the court was sustained upon that ground; although it was held in *New York v. New Jersey* that the complainant had not established a case.

In the case of *Wyoming v. Colorado*, 259 U. S. 419, 66 L. Ed. 999, there had been no pendency of private suits by the water appropriators situate in Wyoming.

The State of Colorado had purported to authorize two corporations created under its laws to divert a part of the water of the Laramie river in Colorado into the valley of Cache la Poudre, and the corporations were proceeding to effect such diversion. The appropriators of water from the Laramie river, situate in Wyoming, were threatened by that action of the State of Colorado and of the two corporations under its authority, with a loss of a large part of the flow of the water in the Laramie river, from which they had obtained their supply of water for irrigation. There was a single threatened injury which would effect in a similar manner all of the Wyoming appropriators, with rights which were vested and prior to any which could be obtained by the two corporations under purported authority of the laws of Colorado.

In the case of *North Dakota v. Minnesota*, 263 U. S. 365, 68 L. Ed. 342, this court took jurisdiction of a bill by North Dakota against Minnesota. The bill charged that Minnesota, by the construction of drainage ditches and the straightening of the Mustinka river, increased the speed and volume of its flow to Lake Traverse,

and thereby raised the level of the lake, and caused its outlet, the Bois de Sioux river, to overflow and greatly injure a valuable farming area in North Dakota on the west bank of the latter stream. Damage was alleged to North Dakota by the destruction of roads and bridges, and damage to the owners of the farms in the destruction of crops and injury to the arable quality of their land in a large amount. The court held that North Dakota had such an interest as quasi sovereign in the comfort, health and prosperity of her farm owners, that resort might be had to that court for relief, and that the bill alleged the creation of a public nuisance. By the course of action of Minnesota in the construction of its drainage system it was the result of the allegations that there was a like kind of injury which caused and which threatened to cause many farm owners in the Bois de Sioux valley in North Dakota great damage, although the amount of injury in each instance might be different. The court said:

"The right of a state as *parens patriæ* to bring suit to protect the general comfort, health or property rights of its inhabitants, threatened by the proposed or continued action of another state, by prayer for injunction, is to be differentiated from its lost power as a sovereign to present and enforce individual claims of its citizens as their trustee against a sister state. For this reason the prayer for a money decree for the damage done by the floods of 1915 and 1916 to the farms of individuals in the Bois de Sioux valley is denied for lack of jurisdiction."

The instant case by the State of Colorado is for the purpose of taking away from the District Court the jurisdiction of the two cases, in which the District Court has made some rulings adverse to the Colorado defendants and in which the Colorado defendants will be required to present evidence in support of their contentions of priority of rights. That evidence will differ according to the time of the appropriation and the methods pursued by each of the Colorado defendants.

There is no allegation of any acts or threat of acts by the State of Kansas that will cause a similar injury to the defendants in the cases in the District Court. There is no allegation of any physical acts or the threat of any physical acts by the Water Users' Association which will cause any injury to those defendants. The Water Users' Association has gone into the District Court to litigate its claims of priority against the defendants—a course of procedure which it had a right to take.

Conclusion:

In conclusion we submit that the State of Kansas should be dismissed. There will then remain the sole question of what is the meaning and effect of the decision in *Kansas v. Colorado*. Its meaning is plain, and as this court will continue to follow the long line of decisions cited in our original brief, then the United States District Court for Colorado has jurisdiction of the cases brought by the association and should proceed to judgment in the usual way.

All of which is respectfully submitted.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,
JOHN G. EGAN,
Asst. Attorney-general of the State of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.
F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

12-4237

FILE COPY

Supreme Court, U. S.
D
NOV 30 1928
E. ROPLEY
CLERK

IN THE

Supreme Court of the United States

No. 16, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, *Defendants*.

SUPPLEMENTAL BRIEF FOR DEFENDANTS ON THEIR MOTION TO DISMISS THE BILL OF COMPLAINT IN EQUITY AND THE CASE.

WILLIAM A. SMITH,
Attorney-General of the State of Kansas.

JOHN G. EGAN,
Asst. Attorney-General of the State of Kansas.

CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

PRESS OF BYRON S. ADAMS, WASHINGTON, D. C.

INDEX.

Page

EXTRACTS FROM THE BRIEFS FOR COLORADO AND KANSAS AND FROM ANSWERS TO QUESTIONS OF THE COURT BY COLORADO AND FROM AN ORAL ARGUMENT FOR COLORADO IN THE CASE OF KANSAS VS. COLORADO, 206 U. S. PAGE 46.

From the brief for Kansas at the final hearing.... 2

From the brief for Colorado at the final hearing. 4

From the answers by Mr. Clyde C. Dawson of counsel for Colorado to questions which had been asked by the Court in ruling on the demurrer of Colorado to the bill 5

From the oral argument on behalf of Colorado by Mr. Clyde C. Dawson at the final hearing..... 6

From the brief for Colorado in reply to the brief of the United States of America, Intervener... 6

QUOTATIONS FROM AND REFERENCES TO KANSAS STATUTES ON THE SUBJECT OF IRRIGATION 8

Page
General Statutes of Kansas, 1868..... 8
Chapter 23—Corporations.
Sections 4 and 5—Purposes for which corporations may be formed including for irrigation.
Section 89—Some powers of a canal corporation for the purpose of irrigation.
Session Laws of Kansas, 1876..... 9
Chapter 58—Concerning Irrigating Corporations.
Section 1—Appropriation of land for irrigating corporations; priorities in right to water.
Section 2—Power of irrigating company to sell water.
Session Laws of Kansas, 1886..... 11
Chapter 115—Irrigating Corporations.
Section 1—Priorities to water as between appropriators.
Section 2—Change of place of diversion.
Section 3—Posting notice.
Section 4—Beginning work to divert water.
Section 5—Record of county clerk.
Section 6—Effect as evidence of title of location of right of way.
Section 7—Title to right of way by limitation.
Section 8—Damages for right of way.
Session Laks of Kansas, 1891, Chapter 133..... 14
Irrigation—Agricultural and Other Purposes.
Article 1
Section 1—Rule as to natural water west of the ninety-ninth meridian.
Section 2—Appropriation of beneficial uses within reasonable time.
Section 7—id.
Section 8—Lawful and beneficial uses.
Section 9—Rights of prior appropriators of water subject to eminent domain.

Page

Articles 2, 3, 4, 5, 6, 7 and 8—Various Provisions in the Act.

Session Laws of Kansas, 1899..... 17

Chapter 95.

Section 1—Appropriations of right of way for irrigation purposes by eminent domain.

Section 2—Sale of water by irrigating companies.

Some Provisions in the Revised Statutes of Kansas, 1923, Concerning Irrigation..... 18

17-202—Authority to incorporate for irrigation purposes.

42-109—Condemnation of right to take water.

42-110 to 42-117—Condemnation Proceedings.

42-118 to 42-317—Miscellaneous provisions.

42-101—Right to use of running water priority as between appropriators.

42-102—Change of place of diversion.

42-103—Notice at point of diversion.

42-104—Time within which claimant must commence works for appropriation.

42-105—Recordation of notice.

42-106—Works prior to 1884.

42-107 and 42-108—Miscellaneous.

42-301—Diversion and appropriation of natural waters west of the ninety-ninth meridian.

42-302—Extent of appropriation; residue of waters.

42-303—Right to conduct water along natural channels.

42-304, 42-310, 42-311, 42-312—Miscellaneous.

42-313—Right to collect and store water.

42-314, 42-315, 42-321 to 42-329—Miscellaneous.

42-329—Distribution of water at source of supply among proprietors of works.

IN THE

Supreme Court of the United States

No. 15, Original, October Term, 1927.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, *Defendants*.

SUPPLEMENTAL BRIEF FOR DEFENDANTS ON THEIR MOTION TO DISMISS THE BILL OF COMPLAINT IN EQUITY AND THE CASE.

The purpose of this is to present extracts from some of the briefs and from an oral argument in the case in this Court of State of Kansas, Complainant, vs. State of Colorado et al., Defendants, the United States of America, Intervener, No. 3 original, decided May 13, 1907, reported in 206 United States, page 46.

IN KANSAS VS. COLODARO, EACH STATE ASSERTED THERE WAS IN THAT CASE NO ISSUE AS TO PRIORITY BETWEEN INDIVIDUAL WATER APPROPRIATORS ON OPPOSITE SIDES OF THE BOUNDARY LINE BETWEEN THE TWO STATES.

The brief, on final hearing for Complainant, for the State of Kansas, in the case of Kansas vs. Colorado, is bound in Vol. 4, Transcript of Records and File Copies

of Briefs 1906, Office of the Supreme Court of the United States. The following quotation is from pages 236-238 of the brief for the state of Kansas on the final hearing:

"The state of Kansas has a vested right in the system of irrigation in western Kansas, and may maintain and protect such system, affecting a large part of the territory and a great number of its citizens, by any appropriate action.

"Between the years 1879 and 1888 an irrigation system grew in the Arkansas Valley in western Kansas. Eight different corporations were chartered by the State of Kansas between October 8, 1879, and November 29, 1887, and these companies were organized for the purpose of irrigating the bottom lands along the Arkansas river between the state line and Kinsley. These corporations were referred to in Section 14 of this brief, and the dates of their charters were there given, and the evidence shows that within two or three years after the corporations were chartered the ditches were constructed and the water was turned in and used. A few other and smaller ditches were also constructed by private individuals. The charters of all these corporations were introduced in evidence as exhibits Nos. 13, 46, 47, 48, 48½, 49, 49½, 54, 54½. These corporations are still in existence, and operating under the laws of the state of Kansas.

"The state of Kansas has passed a number of laws for the protection of the system of irrigation suited to this part of the state of Kansas. This irrigation system was built up with the consent and under the control of the State of Kansas, and in that system the state of Kansas has now a vested legal and constitutional right, and such a right as can not be impaired or

interfered with by subsequent acts of any other state, or by the citizens of any other state. The acts of Colorado and its citizens who are the defendants in this case, of which we complain, were all subsequent to the establishment of this irrigation system in the five western counties of Kansas through which the Arkansas valley extends. In fact, it was from this system in Kansas that Colorado and her citizens conceived the idea of successful irrigation in the Arkansas river. Their system has grown as ours has diminished. The success of their system has been the destruction of ours, and their prosperity is built upon our misfortune. The water of the Arkansas river was used within the boundary of Kansas many years prior to the depletion of the river west of the state line by the defendants in this case. By the enhancement of the value of these lands the state of Kansas derived a great and increasing revenue from taxation, and in these taxes the state of Kansas has a vested right inuring to its benefit long prior to the depletion of the river by the defendants in the state of Colorado.

"In this case the state of Kansas is not appearing for any individual, or any corporation, for any ditch company, or for any individual owner of land under these ditches. The state of Kansas is not aiding any particular title nor any single right connected with any particular piece of land. It is not attempting to establish the exact date of a particular priority nor is it attempting to sustain the right of any individual or corporation to a particular amount of water that was used in any ditch for the purpose of irrigation. No such allegation as that is found in the bill and no proof was introduced in evidence to sustain any such claim. The state of Kansas on the contrary, however, appears as

parens patriae, guardian or trustee of all these interests which have been vitally affected or wholly destroyed. The state of Kansas has a prior and vested right in this whole system extending through five counties, including more than two hundred thousand acres of land, profitably employing many thousands of its citizens and yielding an annual revenue that helps to sustain its institutions and pay its expenses. The injury to this irrigation system is a real legal and well-founded injury and for which the state of Kansas has the right to seek relief in this court and in this case."

The next quotation is from the brief on behalf of the state of Colorado on the final hearing in the case of Kansas vs. Colorado, which is bound in Vol. 5, the Transcript of Records, 1906, and appears at pages 296-297.

"2. Entirely independent of the considerations set forth in the preceding section of this argument, it may be said that under the evidence produced in this cause it is impossible to find any 'vested right' in individual appropriators which is shown to have been injured in any degree by actions of the defendants or any of them.

"In a certain vague way the complainant claims that the state of Kansas has a vested right in the system of irrigation in western Kansas, but the complainants brief expressly says, 'The state of Kansas is not aiding any particular title, nor any single right connected with any particular piece of land. It is not attempting to establish the exact date of a particular priority, nor is it attempting to sustain the right of any individual or corporation to any particular amount of water used in any ditch for the purpose of irrigation. No such allegation as that is found in the bill, and no proof was introduced to sustain the claim.' (Pl. Br. 238.)

"In the absence of both allegation and proof on this subject this Court surely cannot find as a matter of fact that any 'vested right' existed in any Kansas ditch owner which can here be asserted as against the defendants."

In Vol. 5 of the same Transcript of Records, in Kansas vs. Colorado, there are some answers by Mr. Clyde C. Dawson, of counsel for Colorado, to questions propounded by the court in ruling on the demurrer of Colorado. These answers are recited as being given in the oral argument on the final hearing. We quote from page 2 of these answers:

"#3rd. Whether certain persons and corporations of Colorado must be made parties here? The question has in part been answered by the complainant making in the amended bill various corporations in Colorado parties defendant and if the complainant seeks any decree in this case which shall attempt to adjudicate any rights as between ditch owners in Kansas and Colorado then we believe it is clearly established by the evidence that still other persons and corporations both in Colorado and Kansas will be necessary parties to this suit and that the bringing in of such persons would oust the jurisdiction of the Court, if that has not already been done by the bringing in of the corporation defendants."

The last quotation also appears at page 229 of the oral argument at the final hearing bound in Vol. 5 in the same Transcript of Records, 1906, in the case of Kansas vs. Colorado.

At page 227 of the oral arguments in Vol. 5 Transcript of Records, 1906, Mr. Clyde C. Dawson, of counsel for Colorado, said:

"I will say practically nothing as to the Kansas

ditches. Neither in the bill nor in the amended bill filed by Kansas in this case were they mentioned. One will search these documents in vain to find any claim based upon the theory of appropriation or upon the fact that any ditch had ever been built in Kansas.

"We heard but little of the Kansas ditches until counsel reached western Kansas in the examination of their witnesses in rebuttal. We had a right to assume that they based nothing upon that, because at page 5 of the arguments by Mr. Ware, filed on the demurrer by Kansas in this case, he says, 'We are not asking that a ditch be closed in Colorado in order that one may be opened in Kansas. We are only asking that sufficient water be permitted to flow in our river to fertilize our fields in a natural way.'

"That is what they said in their brief upon this matter, so I will leave that to my friend who represents one of the great ditch owners, if he cares to say anything upon this subject which is absolutely foreign to the complaint in this case."

We quote the following from the "Brief of the State of Colorado in reply to the Brief of Intervener." The Intervener was the United States of America. That brief is bound in Volume 5 of the Transcript of Records referred to. We quote from pages 32 and 33:

"The Intervener asks this court to announce a doctrine to the effect that he who is prior in time in the actual appropriation of the water, and continues to apply the same, is prior in right, *irrespective of state lines*, and irrespective of ownership, riparian or otherwise, if within the water shed of the streams from which the water is drawn. Intervener's Brief 202.

"We respectfully submit that the question as to relative rights of appropriators of the waters of an inter-

state stream having lands in different state jurisdictions is not now before this court. It is not brought into this case by the state of Kansas by its bill, for in that bill any right based on priority of appropriations is distinctly repudiated. If we should ignore the defect in the bill and look to the evidence as to the Garden City ditches, we shall find that even then there is no situation of fact which invokes a decision by this court. See our discussion as to Kansas ditches. (Colorado Brief pp. 198-214)".

And from page 34 of the brief for Colorado, in reply to the Intervener:

"It may well be that in a controversy between individual appropriators on opposite sides of a state line, but on the same stream, the question of relative right may properly be the subject of judicial cognizance and decision, but in any such case all the facts and circumstances which go to control the extent and character of the rights asserted must be presented before a sound decision can be made."

And from page 36 *id.*:

"In view of these decisions affecting the subject of interstate control of waters used for purposes of irrigation, we respectfully submit that the case at bar does not justify or permit the announcement of any rule upon this subject of relative rights of appropriation on the opposite sides of the state line, and that the question must await either further legislative action or constitutional amendment, as hereinabove suggested, or be left for a decision in a specific case involving individual rights under the particular conditions and circumstances which may be at the time of presenting to the Court for decision."

QUOTATIONS FROM AND REFERENCES TO KANSAS STATUTES ON THE SUBJECT OF IRRIGATION.

GENERAL STATUTES OF KANSAS 1868.

CHAPTER 23.

CORPORATIONS.

"Sec. 4. Private corporations may be created by the voluntary association of five or more persons, for the purposes and in the manner mentioned in the following sections of this article."

"Sec. 5. The purposes for which the private corporations, mentioned in the last section may be formed are: * * * Thirty-fourth, The construction and maintenance of canals for the purposes of irrigation or manufacturing purposes." (Pages 191-192 id.)

"Sec. 89. Every canal corporation, for the purpose of irrigation, shall, in addition to the powers heretofore conferred, have power: First, To cause such examination and survey for its proposed canal to be made as may be necessary to the selection of the most advantageous route, and for such purpose, by its officers, agents or servants, to enter upon the lands or waters of any person. Second, To take and hold such voluntary grants of real and other property as shall be made to it to aid in the construction and maintenance of its canal, ditches and sluices. Third, To lay out a canal, not exceeding fifty feet in width, and to construct the same; and, for the purpose of cuttings and embankments, to take as much more land as may be necessary for the proper construction and security of the canal or any of its branch ditches or sluices. Fourth, To construct its canal across, along or upon any stream

of water. Fifth, To furnish water for irrigation at such rates as such organization or corporation may by its bylaws and regulations prescribe. Sixth, To borrow such sums of money as may be necessary for completing and finishing or operating their canal, and to issue and dispose of their bonds for any amount so borrowed, and to mortgage their corporate property and franchises to secure the payment of any debt contracted by the corporation for the purposes aforesaid: Provided, That damages for any property appropriated by such corporation shall be assessed and paid for as is provided for in case of railroads." (Pages 214-215 id.)

SESSION LAWS OF KANSAS 1876.

CHAPTER 58.

CORPORATIONS—IRRIGATING OR HYDRAULIC.

"An Act amendatory of chapter sixty-four of the laws of 1871, and supplemental to article nine, chapter twenty-three, of the general statutes of 1868."

"Be it enacted by the Legislature of the State of Kansas:

Section 1. That section eighty-eight of an act concerning private corporations, passed and approved February twenty-ninth, eighteen hundred and sixty-eight, as amended by chapter sixty-four of the laws of eighteen hundred and seventy-one, be further amended so as to read as follows: Section 88. Lands may be appropriated for the use of a macadam, plank road, telegraph, hydraulic, irrigating corpora-

tions in the same manner as is provided in this article for railway corporations, as far as applicable, and any hydraulic or irrigating corporation desiring to conduct water in pipes, canals or raceways, or transmit power by shafting, belting and pulleys, or ropes and pulleys, may obtain the right of way for such pipes, canals, raceways, shafting, belting and pulleys, and ropes and pulleys, in manner as aforesaid; and such pipes, canals, raceways, shafting, belting and pulleys, or ropes and pulleys, may be laid through or over any lands or lots, or along or upon any stream of water, using so much of the water thereof as may be needed for the purposes for which the corporation was organized, or through any street or alley or public ground of any city of the second or third class: Provided, That no such canal shall be located through any street or alley or any public ground of any city without the consent of the municipal authorities thereof: Provided further, That it shall be unlawful for any corporation or person to locate or construct any irrigating canal along or upon any stream of water, or take and use the waters of any stream in such manner as to interfere with or in any wise hinder, delay or injure any milling or irrigating improvements already constructed or located along or upon any stream or water, or to diminish the supply of water flowing to or through any established irrigating canal.

"Sec. 2. That any hydraulic or irrigating company, organized under the laws of this state, may furnish sell or lease, for such time as it may determine, any portion of its water or power to any person who may wish to use the same, and may convey water in pipes or canal, and may transmit power by shafting, belting and pulleys, or ropes and pulleys, and may borrow

such sums of money as may be necessary for completing and finishing or operating its canals, pipes, dams, mills, or machinery, and may issue and dispose of its bonds for any amount so borrowed, and may mortgage its corporate property and franchises, or any part of the same, to secure the payment of any debts contracted by the corporation for the purposes aforesaid.

"Sec. 3. The original section one, chapter sixty-four of the laws of eighteen hundred and seventy-one, is hereby repealed.

"Sec. 4. This act shall take effect and be in force from and after its publication in the Kansas Farmer.

"Approved March 4, 1876." (Pages 153-154 id.)

SESSION LAWS OF KANSAS 1886.

CHAPTER CXV.

IRRIGATION.

AN ACT CONCERNING IRRIGATION.

"Be it enacted by the Legislature of the State of Kansas:

"Section 1. The right to the use of running water flowing in a river or stream in this state, for the purposes of irrigation, may be acquired by appropriation. As between appropriators, the one first in time is the first in right.

"Sec. 2. Any person, company or corporation entitled to the use of water may change the place of diversion, if others are not injured by such change, and may extend the canal, ditch, flume or aqueduct by which the diversion is made to places beyond that to where the first use was made.

"Sec. 3. Any person, company or corporation de-

siring hereafter to appropriate water, must post a notice in writing at a conspicuous place at the point of diversion, stating therein: First, That such person, company or corporation claims the water there flowing to the extent of————(giving the number of) inches, measured under a four-inch pressure, and describing and defining as accurately as may be the place of diversion; second, the means by which such person, company or corporation intends to divert it, and the size of the canal ditch, or flume, or aqueduct, in which he intends to divert it. A copy of such notice must, within ten days after it is posted at the place of diversion, be also posted in a conspicuous place in the office of the county clerk of the county in which such place of diversion is situated, and be recorded by the county clerk in a book to be kept for that purpose.

"Sec. 4. Within sixty days after the notice is posted, the claimant must commence the excavation or construction of the works in which such claimant intends to divert the water, and must prosecute the work diligently and uninterruptedly to completion, unless interrupted by stress of weather. By completion is meant conducting the water to the place of its intended use. By a compliance with the above rules, the claimant's right to the use of the water relates back to the time the notice was posted. A failure to comply with such rules shall deprive the claimant of the right to the use of the water as against a subsequent claimant who complies therewith.

"Sec. 5. The county clerk of each county where water is appropriated for the purpose of irrigating lands, shall keep a book in which he shall record the notices provided for in this act, together with verified proof of the posting thereof.

"Sec. 6. Where any canal, ditch, flume, or aque-

duct, which is the property of any individual, company, or corporation, and is used for the purpose of irrigating lands, has been located or constructed upon or over any tract of land with the knowledge or consent of the owner of such lands, or upon or over any tract of land owned by the United States, and prior to the occupation of the same by any settler for the purpose of entry under any act of congress, such location and construction shall be prima facie evidence that the same was rightful; and such canal, ditch, flume or aqueduct shall be deemed and held to come within the provisions and protection of section one of chapter one hundred and thirty-four of the session laws of eighteen hundred and eighty-five: Provided, however, That such canal, ditch, flume or aqueduct shall have been constructed for a period of at least two years prior to the first day of January, A. D. eighteen hundred and eighty-six.

"Sec. 7. Any individual, company or corporation who has heretofore constructed any canal, ditch, flume or aqueduct for purposes of irrigation upon or over lands unoccupied at the time of such construction, who shall maintain the same for the period of five years succeeding such construction, without objection in writing from the owner of such land, or subsequent claimant under the laws of the United States or of the state of Kansas, shall after the expiration of said period of five years, be deemed and held to have acquired a permanent right-of-way for such canal, ditch, flume, or aqueduct, not exceeding, however, the total width of three times the width of such canal, ditch, flume, or aqueduct.

"Sec. 8. When any individual, company or corporation shall have constructed any canal, ditch, flume or aqueduct, for purposes of irrigation over unoccupied

lands of another, the damages awarded for the right-of-way of such canal, ditch, flume or aqueduct shall not exceed the value of the land occupied at the date of such construction, and neither the enhanced value of the land growing out of the construction of such canal, ditch, flume, or aqueduct, nor the subsequent enhancement of its value through settlement made after the construction of such canal, ditch, flume or aqueduct, shall be considered in estimating the damages for such right-of-way: Provided, Such canal was constructed with the knowledge and without protest from the owner of the land.

"Sec. 9. This act shall take effect and be in force from and after its publication in the official state paper.

"Approved February 19, 1886." (Pages 154-156 id.)

SESSION LAWS OF KANSAS 1891.

CHAPTER 133.

IRRIGATION.

"An Act providing for and regulating the diversion, appropriation, storage, and distribution of waters for industrial purposes within prescribed limits and of the construction, maintenance and operation of works therefor; prohibiting unlawful use thereof or interference therewith; providing for the creation of irrigation districts having certain powers; fixing penalties for and assigning jurisdiction of offenses hereunder; defining the powers and duties of certain public officers; and for other purposes.

"Be it enacted by the Legislature of the State of Kansas:

"In the manner following; that is to say:

ARTICLE 1.

OF THE DIVERSION AND APPROPRIATION OF WATER FOR INDUSTRIAL USES.

Section 1. In all that portion of the state of Kansas situated west of the ninety-ninth meridian, all natural waters, whether standing or running, and whether surface or subterranean, shall be devoted first, to purposes of irrigation in aid of agriculture, subject to ordinary domestic uses, and secondly, to other industrial purposes, and may be diverted from natural beds, basins, or channels, for such purposes and uses: Provided, That no such diversion shall interfere with, diminish or divest any prior vested right of appropriation for the same or a higher purpose than that for which such diversion is sought to be made without the due legal condemnation of, and compensation for, the same; and natural lakes and ponds of surface-water, having no outlet, shall be deemed parcel of the lands whereon the same may be situate, and only the proprietors of such lands shall be entitled to draw off or appropriate the same.

"Sec. 2. The appropriation of water hereafter shall, in every case, be deemed and be taken to be accomplished and effectual only as to so much water as shall have been actually applied to beneficial uses within a reasonable time after the commencement of the works by means of which such appropriation is intended to be made, or afterwards where no appropriation has in the meantime been initiated by others, together with the reasonable amount necessary to supply losses by waste, seepage and evaporation; all the residue of the water within the capacity of the canal or other works shall be deemed to be derelict, and li-

able to appropriation by any subsequent appropriator.

"Sec. 7. Every person complying with the provisions of this act, and applying the waters obtained by means of any artesian well to beneficial uses, shall be deemed to have appropriated such waters to the extent to which the same shall be so applied within a reasonable time after the commencement of the works, and such appropriation shall have effect as of the day of commencement of such works, provided the same is prosecuted with reasonable diligence; otherwise, from the time of the application of the waters thereof to beneficial uses.

"Sec. 8. Any prior right of appropriation shall exist and continue only by the exercise thereof in a lawful manner, and any failure of such appropriator continuously to apply such water to lawful and beneficial uses, without due and sufficient cause shown for such failure, shall be deemed an abandonment and surrender of such right.

"Sec. 9. Every vested right of prior appropriation or diversion of water for industrial uses shall be subject as to the right of eminent domain, and may be condemned and compensated for, for public and beneficial uses, in the same manner and under the same restrictions and regulations as govern the condemnation of other private property." (Pages 223-226, id.)

This Act extends from page 223 to page 260 of the Session Laws of Kansas 1891. The headings of the articles after the first are as follows:

"Article II, Of the right of use of water." There are six sections in this Article.

"Article III, of right-of-way and site for works for appropriation and devoting waters to beneficial uses." There are five sections in this Article.

"Article IV, of the construction, maintenance and operation of works for appropriating and devoting waters to beneficial uses." There are 32 sections in this Article.

"Article V, of the disposal of seepage waters." There are two sections in this Article.

"Article VI." This Article vests power in the Board of Railroad Commissioners to fix upon complaint reasonable charges for water furnished by an irrigation company to users thereof. There are two sections in this Article.

"Article VII, of the creation of irrigation districts having certain powers." There are twenty-four sections in this Article.

"Article VIII, of unlawful interference with, injury to, or use of, works appropriating and devoting water to beneficial uses, or the water thereof; and of penalties therefor, and proceedings for the punishment of offenses respecting the same." There are twenty-five sections in this Article. (Pages 223-260 id.)

SESSION LAWS OF KANSAS 1899.

CHAPTER 95.

RELATING TO RIGHT OF WAY AND LEASES OF CERTAIN CORPORATIONS.

Section 1 of this chapter amends Section 1 of chapter 85, Laws of Kansas, 1891, the same being Sections 1397 and 1398 of General Statutes of 1889. It provides, infer alia:

"Sec. 1397. Lands may be appropriated for the use of * * * irrigating * * * corporations * * * in the same manner as is provided in this Article for railway corporations, as far as applicable; and any

* * * irrigating * * * company * * * desiring the right to dam or take water from any stream, to conduct water in canals or raceways or pipes * * * may obtain such right or the right of way for all necessary canals, raceways, pipes * * * in the manner as aforesaid; and such canals, raceways, pipes * * * may be laid, carried or stretched on, through or over any land, or lot, along or upon any stream of water, using so much of the water thereof as may be needed for any of the purposes aforesaid, * * * provided further, that it shall be unlawful for any person or corporation to locate or construct any irrigating canal or raceway along or upon any stream of water, or take and use the water of any stream in such manner as to interfere with or in anywise hinder, delay or injure any milling or irrigating improvements already constructed or located along or upon any stream or water, or to diminish the supply of water flowing to or through any established irrigating canal.

Section 2 of this chapter 95, Laws of Kansas 1899, amends Section 1398 of the General Statutes of Kansas 1889 and provides, inter alia:

"That any * * * irrigating * * * company * * * may furnish, sell, let or lease, for such time as such corporation may determine, any portion of its water * * * to any person or persons, or corporation or partnership, who may wish to use the same, and may convey water in channels, raceways or pipes." (This chapter appears on pages 191-193 Session Laws of Kansas 1899.)

THE FOLLOWING QUOTATIONS ARE FROM THE REVISED STATUTES OF KANSAS, 1923:

Titles of the headings are given of the sections which are not quoted.

"17-202. Authority to incorporate. The purposes for which private corporations may be formed are:

"* * *—(Clause 37). The construction and maintenance of dams and canals for the purpose of waterworks, irrigation, or manufacturing purposes."

"42-109. Condemnation of right to take water. Any and all irrigating-ditch and canal companies which have been heretofore organized or incorporated, or which may hereafter become organized and incorporated, for the purpose of procuring or furnishing water for the purposes of irrigation, which shall desire to condemn the right to take such water from any stream in the state of Kansas, shall have the right to procure such condemnation for such purpose in the following manner. (L. 1889, ch. 165, p. 1; March 27.)

"42-110. "Petition to district court; appointment of commissioners.

"42-111. Notice by such commissioners.

"42-112. Assessment of damages.

"42-113. Report of commissioners.

"42-114. Time for such report.

"42-115. Appeals from decision of commissioners.

"42-116. Trial of such appeal.

"42-117. Filing of report and payment of damages.

"42-118. Right to take water condemned.

"42-119. Lien upon crop for water.

"42-120. Powers of canal corporations.

"42-121. Water rights and shares in irrigation companies.

"42-122. Offenses affecting works.

"42-316. Right of way and site for works for diverting, storing or conveying water.

"42-317. Condemnation of lands for site or way.

"42-101. Right to use of running water. The right

to the use of running water flowing in a river or stream in this state, for the purposes of irrigation, may be acquired by appropriation. As between appropriators, the one first in time is the first in right. (L. 1886, ch. 115, p. 1; Feb. 26.)

"42-102. Change of place of diversion. Any person, company or corporation entitled to the use of water may change the place of diversion, if others are not injured by such change, and may extend the canal, ditch, flume or aqueduct by which the diversion is made to places beyond that to where the first use was made. (L. 1886, ch. 115, p. 2; Feb. 26.)

"42-103. Notice at point of diversion. Any person, company or corporation desiring hereafter to appropriate water must post a notice in writing at a conspicuous place at the point of diversion, stating therein: *First*, That such person, company or corporation claims the water there flowing to the extent of——— (giving the number of) cubic feet per second, and describing and defining as accurately as may be the place of diversion; *second*, the means by which such person, company or corporation intends to divert it, and the size of the canal, ditch or flume or aqueduct in which he intends to divert it. A copy of such notice, together with proof of the posting thereof, must, within ten days after it is posted at the place of diversion, be filed in the office of the register of deeds of the county in which such place of diversion is situated, and be recorded by such register of deeds in a book to be kept for that purpose. (Revised, 1923; old sections, L. 1886, ch. 115, p. 3; L. 1891, ch. 133, art. 8, p. 25.)

"42-104. Time within which claimant must commence works for appropriation. Within six months after the notice is posted, the claimant must commence

the excavation or construction of the works in which such claimant intends to divert the water and must prosecute the work diligently and uninterruptedly to completion, unless interrupted by stress of weather or other unavoidable circumstance. By compliance with the above the claimant's right to the use of the water relates back to the time the notice was posted. A failure to comply with the above conditions shall deprive the claimant of the right to use of the water as against the subsequent claimant who complies therewith: *Provided*, That in any case wherein such notice has already been posted and the said sixty days has not yet expired the party or parties posting said notice, or their grantees or assigns shall have six months from the taking effect of this act within which to commence the excavation or construction of the works as herein provided. (L. 1886, ch. 115, p. 4; L. 1911, ch. 216, p. 1; Jan. 27.)

"42-105. Recordation of notices. The register of deeds of each county where water is appropriated for the purpose of irrigating lands shall keep a book in which he shall record the notices provided for in this act, together with verified proof of the posting thereof. (Revised, 1923; old section, L. 1886, ch. 115, p. 5.)

"42-106. Works prior to 1884. Where any canal ditch, flume or aqueduct which is the property of any individual, company, or corporation, and is used for the purpose of irrigating lands, has been located or constructed on or over any tract of land with the knowledge or consent of the owner of such lands, or upon or over any tract of land owned by the United States, and prior to the occupation of the same by any settler for the purpose of entry under any act of con-

gress, such location and construction shall be prima facie evidence that the same was rightful; and such canal, ditch, flume or aqueduct shall be deemed and held to come within the provisions and protection of section one of chapter one hundred and thirty-four of the Session Laws of eighteen hundred and eighty-five: Provided, however, That such canal, ditch, flume or aqueduct shall have been constructed for a period of at least two years prior to the first day of January, A. D. eighteen hundred and eighty-six. (L. 1886, ch. 115, p. 6; Feb. 26.)

"42-107. Construction of work on or over unoccupied lands.

"42-108. Measure of damages for right of way.

"42-301. Diversion and appropriation of natural waters west of ninety-ninth meridian. In all that portion of the state of Kansas situated west of the ninety-ninth meridian, all natural waters, whether standing or running, and whether surface or subterranean, shall be devoted, first, to purposes of irrigation in aid of agriculture, subject to ordinary domestic uses; and secondly, to other industrial purposes; and may be diverted from natural beds, basins or channels for such purposes and uses: *Provided,* That no such diversion shall interfere with, diminish or divest any prior vested right of appropriation for the same or a higher purpose than that for which such diversion is sought to be made, without the due legal condemnation of and compensation for the same; and natural lakes and ponds of surface water, having no outlet, shall be deemed parcel of the lands whereon the same may be situate, and only the proprietors of such lands shall be entitled to draw off or appropriate the same. (L. 1891, ch. 133, art. 1, p. 1; May 20.)

"42-302. Extent of appropriation; residue of waters. The appropriation of water hereafter shall in every case be deemed and be taken to be accomplished and effectual only as to so much water as shall have been actually applied to beneficial uses within a reasonable time after the commencement of the works by means of which such appropriation is intended to be made, or afterwards where no appropriation has in the meantime been initiated by others, together with the reasonable amount necessary to supply losses by waste, seepage and evaporation; all the residue of the water within the capacity of the canal or other works shall be deemed to be derelict, and liable to appropriation by any subsequent appropriator. (L. 1891, ch. 133, art. 1, p. 2; May 20.)

"42-303. Right to conduct water along natural channels and withdraw same. Any person may conduct water into and along any of the natural streams or channels of the state, and may withdraw all such waters so by him turned into such channel at any point desired, without regard to prior appropriations of water from said stream, due allowance being made for evaporation and seepage. (L. 1891, ch. 133, art. 1, p. 3; May 20.)

"42-304. Change of natural channel so as to prevent inflow into ditch or conduit.

"42-310. Right to continuance of use of water procured from carrier by contract.

"42-311. Right to take water for domestic uses.

"42-312. Such person responsible for injury or pollution.

"42-313. Right to collect and store water. Any person entitled to the use of water for the irrigation of lands or other purposes whatsoever may, at any time

while so entitled to the use thereof, collect and store the same up for use presently thereafter; and the failure to apply or use such waters during the period of such collection and storage shall not be deemed or taken to impair his right in that behalf. .(L. 1891, ch. 133, art. 2, p. 4; May 20.)

"42-314. Abandonment of right to use or enjoyment of water.

"42-315. Right of use of water subject to eminent domain.

"42-321 to 42-329, inclusive, pertain to the construction, operation and maintenance of irrigation works.

"42-329. Distribution of water at source of supply among proprietors of works. The waters of the several streams and sources of supply shall be distributed among the several canals, ditches, conduits and other works so that the proprietors of each of said works, and those entitled to water therefrom, shall, as nearly as may be, and to the extent of their needs, at all times receive and enjoy the waters to which they are severally entitled; and whenever it shall appear that there is flowing into any such works, water to which the proprietor of any other such works having a prior right is entitled, and that such other works having priority of right is not receiving the water necessary for the consumers of water therefrom, and which ought to flow to the same, the head gate of such works having the excess, and being subsequent in right, shall be closed or partly closed, so that a sufficient amount of water of such stream or source of supply may pass and flow to the said works having the priority of right, to the amount to which the same shall be entitled; and if the proprietors of any such works having such excess and being subsequent in

right shall fail or refuse to turn out such supply of water when requested by the party entitled to receive the same so to do, the head gate or waste gate of the works receiving such excess shall be so set and locked by the officer authorized by law to perform such duty as to permit a sufficient amount of said water to pass and flow to the party having the right to receive the same. (L. 1891, ch. 133, art. 4, p. 9; May 20.)

Respectfully submitted,

WILLIAM A. SMITH,
Attorney-General of the State of Kansas.

JOHN G. EGAN,
Asst. Attorney-General of the State of Kansas.

CHESTER I. LONG,
Solicitor for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

FILE COPY

Office Supreme Court, U. S.
FILED
APR 28 1928
CHARLES ELMORE CROPLEY
CLERK

IN THE

Supreme Court of the United States

October Term, 1927

NO. 16, ORIGINAL

THE STATE OF COLORADO,
Complainant,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION,
a corporation,
Defendants.

PLAINTIFF'S BRIEF ON DEFENDANTS' MOTION TO DISMISS.

WILLIAM L. BOATRIGHT,
Attorney General of Colorado.

RALPH L. CARR,
Assistant Attorney General of Colorado.

JAMES GRAFTON ROGERS,
HENRY A. DUBBS,
FRED A. SABIN,
A. WATSON MCHENDRIE,
PLATT ROGERS,
HENRY C. VIDAL,
of Counsel.

Clark QUICK-PRINTING Co., Lawrence 1332-34 Denver, Colo.

INDEX.

	PAGE
Preliminary Statement	1
Outline of Method of Discussion	7
The Contrasting Water Law of Colorado and Kansas	8
a. The Kansas Water Theory	8
b. The Colorado Water Theory	10
The Advanced Administration System Affecting Water Rights in Colorado	14
The Economic and Political Principles in The Colorado Water System	21
The Litigation in Kansas v. Colorado, What it Included and What it Settled	23
Summary of Matters Adjudicated	30
The Inapplicability of Various Decisions Recognizing Priorities Regardless of State Lines	31
Effect of Adjudications Between Individuals	35
a. States Necessary Suitors	36
b. Prior Adjudication between States	36
c. State Ownership in Colorado	38
d. State Administration in Colorado	38
e. Colorado Policy of State Responsibility	39
Technical Propriety of this Proceeding and Remedy Sought	41
a. The suits complained of are substantially against the State of Colorado	45
b. States necessary parties as Trustees for their respective water users	47
c. The Remedy Sought	48
d. Complaint is Ancillary	49
Conclusion	50

LIST OF AUTHORITIES.

	PAGE
A. T. & S. F. R. R. Co. v. Schriver, 101 Kans. 257, 166 Pac. 592	9
Arnold v. Roup, 61 Colo. 316, 157 Pac. 206	18
Bowers v. McFadzean, Colo. , 257 Pac. 361	13
Bellport v. Harrison, 123 Kan. 310, 255 Pac. 52	9
Clark v. Allaman, 71 Kan. 206, 80 Pac. 571	8
Colorado Comp. Laws, 1921, Chap. XXXV	14, 15, 19
Comstock v. Larimer & Weld Co., 58 Colo. 186, 145 Pac. 700	19
Comstock v. Fort Morgan Co., 60 Colo. 101, 151 Pac. 929	19
Cyc., Vol. 39, 612	48
Central Union Trust Co. v. Anderson Co., 268 U. S. 93	50
Ex parte New York, 256 U. S. 490	47
Ex Parte Young, 209 U. S. 123	45
Fletcher's Equity Pleading, Sec. 958 ff.	50
Ft. Lyon Canal Co. v. A. V. S. B. & I. L. Co., 76 Colo. 278, 230 Pac. 615	18
Ft. Collins M. & E. Co. v. Larimer & Weld Co., 61 Colo. 45, 156 Pac. 140	19
Foster v. Neilson, 2 Pet. 253	42
Gordon v. U. S., 117 U. S. 697	44
Georgia v. Brailsford, 2 Dal. 402	49
Georgia v. Tennessee Copper Co., 206 U. S. 230	44, 49
Greeley & Loveland Irr. Co. v. Huppe, 60 Colo. 535, 155 Pac. 386	18

	PAGE
Hagood v. Southern, 117 U. S. 52	46
Harkrader v. Wadley, 172 U. S. 148	46
Hudson Co. v. McCarter, 209 U. S. 349	4, 42
In re Ayers, 123 U. S. 443	47
Kansas v. Colorado, 185 U. S. 125	4, 6, 21, 23, 24
Kansas v. Colorado, 206 U. S. 46	4, 8, 9, 10, 23, 27, 28, 35, 36
Kirkpatrick v. Kirkpatrick, 112 Kan. 314, 211 Pac. 146	9
Kentucky v. Dennison, 24 How. 66	49
Krippendorf v. Hyde, 110 U. S. 276	50
Lamson v. Vailes, 27 Colo. 201, 61 Pac. 231	19
Louisiana v. Jumel, 107 U. S. 711	46
Luther v. Borden, 7 How. 1	42
Madrazo v. Georgia, 1 Pet. 110, 7 Pet. 627	46
Missouri v. Illinois, 180 U. S. 208	43
Missouri v. Illinois, 200 U. S. 496	43
Newark v. New Jersey, 262 U. S. 192, 10 Fed. (2d) 519	42
North Dakota v. Minnesota, 263 U. S. 365	43
Ohio v. West Virginia, 263 U. S. 350	44
Oppenlander v. Left Hand Ditch Co., 18 Colo. 142, 31 Pac. 854	17
Oklahoma v. Texas, 256 U. S. 70	45
Pennoyer v. McConnaughey, 140 U. S. 1	46
Pennsylvania v. West Virginia, 262 U. S. 553	44
Proceedings Am. Soc. for Jud. Sett. Int. Disputes (1915), p. 47	44
Perry on Trusts (6th Ed.), Sec. 877, 886	48
Root v. Woolworth, 150 U. S. 401	50

PAGE

Seven Lakes Co. v. New Loveland Co., 40 Colo. 382, 93 Pac. 485 18
Sterling Irr. Co. v. Downer, 19 Colo. 595, 36 Pac. 787 18
Session Laws, Colo. 1917, Chap. 151 ..... 11, 19
Session Laws, Colo. 1921, Chaps. 242, 243, 245, 246 19
Session Laws, Colo. 1923, Chaps. 133, 134, 135, 189, 190, 191, 192, 193 ..... 14, 19
Session Laws, Colo. 1925, Chaps. 119, 120, 121, 122, 123, 124, 175, 176, 177, 178, 179 ..... 14, 19
Session Laws, Colo. 1927, Chaps. 117, 118, 119, 193 ..... 14, 19
Stockman v. Leddy, 55 Colo. 24, 129 Pac. 220 ..... 13, 19
Snyder v. Colo. Gold Dredg. Co., 181 Fed. 62 42
St. Louis & S. F. R. R. Co. v. Byrnes, 24 Fed. (2d) 66 50

Tennessee v. Arkansas, 249 U. S. 588 43
Town of Sterling v. Pawnee Ditch, 42 Colo. 421, 94 Pac. 339 ..... 18.
Trenton v. New Jersey, 262 U. S. 182 42

Virginia v. West Virginia, 206 U. S. 290 44
Virginia v. West Virginia, 246 U. S. 565 44

Wyoming v. Colorado, 259 U. S. 419 ..... 4, 9, 10, 29, 32
Wright v. Jenks, 124 Kan. 604, 261 Pac. 840 9
Wilson v. Alexander, 276 Fed. 875 50
Wabash Railroad v. Adelbert College, 208 U. S. 38 50
Wisconsin v. Illinois, 270 U. S. 634 43
Wisconsin v. Illinois, 271 U. S. 650 43

Yunker v. Nichols, 1 Colo. 551 17

IN THE

Supreme Court of the United States

October Term, 1927

NO. 15, ORIGINAL

THE STATE OF COLORADO,
Complainant,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION,
a corporation,
Defendants.

PLAINTIFF'S BRIEF ON DEFENDANTS' MOTION TO DISMISS.

PRELIMINARY STATEMENT.

The situation set forth in the Complaint is as searching and deeply founded as it is new in facts. It presents a problem of international law which could not arise except by the peculiar operation of the Federal Judiciary system. Moreover, it has not arisen before even in that system, and a diligent survey of the fifty cases between sovereign states as parties which have

been considered by the Supreme Court in the last one hundred and forty years reveals no comparable circumstances. The States of the United States are, except as limited by the express provisions of the Federal Constitution, independent sovereignties. As such, except where prohibited by the Constitution, they are entitled to maintain, and, indeed, affirmatively expected to maintain, their characters as independent nations. The Constitution and its framers contemplated that the states would preserve and cherish integrity of territory, unity of administration, local government, and the other qualities and activities of the modern sovereignty. Each was expected, and is now expected, to be the natural unit for all social organization, for political policy on domestic affairs, and for the creation, the protection, and the administration of property rights. Across this background the Constitution has written certain specific limitations. Three of these, and three only, materially influence our present problem. The states are forbidden to make war upon each other. The states are further forbidden to make agreements or compacts between each other except by permission of Congress. Finally, there is created a federal judiciary operating not only over and above the states in the form of a Supreme Court which can adjudicate between them, but also operating within their own territory upon their domestic affairs and upon their own citizens in the form of the district courts and circuit courts of appeal. In other words, these independent sovereignties are expected to maintain their character and existence, but the traditional weapons and means of adjustment and agreement between independent states, namely, war, diplomacy, and treaty, are forbidden them. Instead of these traditional means of communication, adjustment and agreement, there is substituted a new device. This device is the power of the United States Supreme Court to adjudicate controversies

between the States, coupled with an implied duty upon the part of the states to resort thereto when controversies arise. The power of compact with consent of Congress is so limited that, historically, it has been little used. The abolition of any ordinary necessity for diplomatic corps and diplomatic machinery, as well as the requirement of congressional consent to any important interstate agreements, has deprived the states not only of the old freedom in ordinary cases to adjust conflicts between themselves, but more subtly, of any familiar and available machinery for negotiation. As a consequence the power of adjudication in the Supreme Court is the one natural outlet and remedy for any conflict over jurisdiction, property or sovereignty which is serious enough and persistent enough to involve a political problem. For the first time in recent history, however, we find states creating diplomatic corps now to handle the problems of interstate streams.

The Constitution never contemplated that the operation of the lower Federal Courts would complicate the integrity of states or the exercise of their natural functions as the units of political action, social order, and the creators and administrators of rights to liberty and property. The power granted Congress to extend the jurisdiction of such subordinate Federal Courts as it might create to certain classes of cases was not intended to impinge upon the powers of the states but intended only to secure the enforcement of the Federal Constitution and laws by independent tribunals and to secure unprejudiced judicial protection for residents of or claimants under the laws of foreign states. The drafters of the Constitution were eloquent in the expression that the creation of subordinate Federal tribunals should never disturb state sovereignty. It is significant that this disturbance of state sovereignty and state integrity by the jurisdiction of the subordinate

Federal Courts should now for the first time in an original proceeding be arising in a single narrow field, namely, in connection with the question of water flowing from one state into another. The subject of interstate commerce which would occur to the mind of any planner of a Federal system as a natural source of such difficulty was removed from state jurisdiction by an express constitutional provision. The possibility of difficulty over large rivers used by commerce seems to have occurred to the founders of the government, as they transferred to the Federal power the control of navigable streams. The depletion of a stream was never imagined. The development of irrigation and the modern demands for water for large municipalities were not anticipated. Both problems have now arisen. In *Hudson County v. McCarter* (infra), and other less striking cases, the Supreme Court has already met the inevitable conflict over municipal water supplies on interstate streams brought about by modern metropolitan life. In *Kansas v. Colorado* (infra) and *Wyoming v. Colorado* (infra), the Court has already met the problem of state conflicts over water for agriculture in the great arid territory of the West. In both of these cases the Supreme Court has so far accorded with the words and spirit of the Constitution by treating these problems as those of international law, and predicated its discussion and decrees upon the idea that they were problems between states as such, at least when the states chose to raise the issue and treat them as such. Already still another field of discussion, namely, that of river control for flood prevention and river use for power development on non-navigable streams, both consequences of increasing population in the West, appears before Congress and will no doubt ultimately reach this Court. In all these cases so far both Congress and the Western States themselves seem desirous of treating the problems on the basis of state sovereignty and of recognizing

and maintaining the integrity and unity of the states. This again is in consonance with the political traditions of our people, with the need of preserving units of local action in so great a national territory, and in accord with the wording of the Constitution and the theory of its designers.

In the present controversy the State of Colorado complains in substance that in the field of irrigation the apparent jurisdiction of the subordinate Federal Courts threatens, indirectly but effectively, to infringe not only upon the independence and integrity of the state sovereignty but, even more strikingly, under the peculiar facts in this case, to impinge upon and disable the Supreme Court itself in the performance of its duty as an adjudicator between sovereign states. Colorado points out that in the normal performance of its functions as a sovereign and a unit of administration, it has developed an original legal theory for the use and control of the most vital wealth and resource in its development, namely, water. It points out that, step by step with this new legal conception of state ownership and control of water, it has developed an elaborate administrative system aimed at the most advanced and economic use of this resource, and it finally indicates that the infringement of this legal theory and the disruption of its complicated administrative system will, in its opinion, leave the state helpless and floundering in the problem of the care and use of the water of its streams. It tries to bring home to the Court a geographical condition and economic system which is unfamiliar to most of the members of the bar. It tries to make vivid the fact that within the borders of Colorado water is the limiting factor and controlling element in every formula and problem of development and civilization. It tries, temperately but earnestly, to make clear that the limits of its water supply are not merely the daily preoccupation of all its builders and citizens, but

that the utilization and administration of its water supply are the prime functions and activities of the state itself. Finally, the state points out that the Supreme Court, in *Kansas v. Colorado*, recognized these facts, adopted these theories, dwelt upon the historical and political development of these principles, and adjudicated as between the states a settlement of the controversy up to the time of that litigation. Colorado then sets out that by indirection but, notwithstanding, by the effective operation of its machinery, the subordinate Federal Court will, unless interfered with, destroy the state unity, disrupt the state administration, and obliterate the adjudication of this Court in the past and its power of effective action in the future.

The principles of domestic law and the rules of private litigation can furnish very little help or guidance in a situation as novel as this. The common law dealt with no such problems as these. They belong in the realm of international and constitutional traditions and not those of domestic tribunals. We are dealing with governments and sovereignties. The principles announced in courts of Common Pleas and King's Bench, with their furniture of writs and sheriffs, can aid us only by remote and dangerous analogy. It is not true, however, that, because of this, the problem can not be systematically discussed. It can be rationalized. There are traditions, precedents, and political conceptions which can be cited and applied within certain obvious limits. With these preliminary views in mind, we shall endeavor briefly to discuss the principles involved in this plea to the Supreme Court. To a considerable extent the Complaint itself—which is necessarily broad and unconventional in its form—supplies the main substance and argument in the case. Perhaps a somewhat more systematic development of the facts and principles therein set forth will aid the Court.

METHOD OF DISCUSSION.

This brief will take up the controversy under the following heads:

I. The contrasting water law of Colorado and Kansas.

II. The advanced administrative system affecting water rights in Colorado.

III. The economic and political principles involved in the development of the Colorado water system.

IV. The litigation in *Kansas v. Colorado*, what it included and what it settled.

V. The inapplicability of various decisions recognizing priorities regardless of state lines to the present controversy.

VI. The effect of adjudications between individuals (i. e., on the sovereignty, operations, administrative machinery, and economic security of the State of Colorado, and upon the previous adjudication in *Kansas v. Colorado.*).

VII. The technical propriety of this proceeding, and the remedy sought.

VIII. Conclusion.

I.

THE CONTRASTING WATER LAW OF COLORADO AND KANSAS.

The defendant's brief hinges upon and is devoted substantially to two arguments: (1) that the defendant Water Association has an appropriation; (2) that it is entitled to enforce this appropriation regardless of state lines, in spite of any policy or conditions in Colorado, and in spite of the adjudication of *Kansas v. Colorado*. If either of these points fail, the motion to dismiss fails.

a. The Kansas Water Theory.

The brief of the defendant spends much space on the discussion of the effect of the Kansas water statutes and the policy of Kansas legislation. While the brief goes into considerable detail, it does not suggest anything which was not elaborately briefed, elaborately argued and fully considered in *Kansas v. Colorado*. In that case, Kansas itself, through its Attorney-General and F. Dumont Smith, Esq., who now appears as counsel for Kansas and the principal counsel for the defendant Water Association, contended that she was a common-law state with the riparian doctrine in full force and that such irrigation as had developed was subordinate to, a part of and a mere minor consequence of the doctrine of riparian rights. They cited *Clark v. Allaman*, 71 Kansas 206, 80 Pac. 571, decided by the Supreme Court of Kansas in 1905, as authority for this view. The lawyers appearing for Colorado attacked this view to some extent but the Supreme Court followed the Kansas argument and held that Kansas did have the riparian doctrine and that the use of running water for irrigation in Kansas was a development of and feature of that riparian doctrine.

Kansas v. Colorado, 206 U. S. 46, 102, 104.

The fifth syllabus of the case (206 U. S. 47) shows that the official reporter interpreted the opinion as we do. The argument of the counsel for Kansas both in the original briefs and oral arguments and as abstracted in the official reports shows that this was the burden of their case. (206 U. S. 57-62; Printed Oral Argument 1906, pp. 51, 54, 210, etc.) The court sixteen years later distinguished *Kansas v. Colorado* from *Wyoming v. Colorado* partly on the ground that the controversy in the former was one between two states "one recognizing generally the common-law rule of riparian rights" and the other the doctrine of appropriation.

Wyoming v. Colorado, 259 U. S. 419, 464, 465.

Clark v. Allaman (supra) is still followed, approved, cited and recited by the Kansas Supreme Court in water cases—

A. T. & S. F. R. R. Co. v. Schriver, 101 Kas. 257; 166 Pac. 519 (1917).

And in its general doctrine—

Kirkpatrick v. Kirkpatrick, 112 Kas. 314; 211 Pac. 146, 152 (1922).

Bellport v. Harrison, 123 Kas. 310; 255 Pac. 52, 54 (1927).

Wright v. Jenks, 124 Kas. 604; 261 Pac. 840, 841 (Dec. 1927).

As the Kansas Supreme Court repeats recently, in citing *Clark v. Allaman*:

> "Generally speaking, the law is not like a costume, to be put on or taken off in conformity to the dictates of usage and custom."
>
> *Bellport v. Harrison*, 123 Kas. 310; 255 Pac. 52, 54.

As it might have said, Kansas had made her river bed and her citizens must lie in it.

It would now appear to be too late for Kansas and for its distinguished counsel who has appeared in both cases to argue as they do in present brief that the doctrine of appropriation applies in Kansas. Appropriation as recognized therein seems to be not the doctrine of the arid states but a somewhat liberal interpretation of the right of irrigation use under the riparian theory. Even if Kansas were now to suggest something new she should surely be committed in this court and against Colorado, if not elsewhere, to this view of her law.

(b) *The Colorado Water Theory.*

As to the legal theory in Colorado it is admitted that Colorado represents a most advanced example of the appropriation doctrine, applicable in its purest sense in the Rocky Mountain States. This is exactly what might be expected from the fact that while the rainfall is sufficient throughout most of Kansas to supply agriculture without irrigation, it is not sufficient in Colorado in any locality so to do. Whatever the conditions of climate might indicate, however, the law in Colorado to this extent needs no further citation.

Kansas v. Colorado, 206 U. S. 46, 55, 109;
Wyoming v. Colorado, 259 U. S. 419, 464, 465.

Colorado has, however, gone much further than the mere adoption of the appropriation doctrine. The complaint (pages 10 to 15) gives special reference to the constitutional provisions of the State and to some decisions of its courts as well as the general practice confirming the statement that the waters of the streams flowing in Colorado are deemed to be the property of the state in its sovereign capacity and that the rights of appropriation for irrigation or other purposes are

derivative or usufructuary licenses granted to individuals and exclusively for use within the state.

Colorado Constitution, Art. XVI, Secs. 5, 6, 7, 8;

Colorado Session Laws, 1917, 539, Secs. 1 and 2.

"In section 5 of article 16 of our state constitution as originally adopted, this public policy is thus tersely expressed: 'The water of every natural stream, not heretofore appropriated, within the state of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided.' Other sections of the same article make such provision. This language is both emphatic and clear. It is the voice of the people who ratified the constitution, and declares for all time the public policy of this state which theretofore had been recognized by all the departments of the dual governments. The statutes which were enacted by the earlier sessions of our general assembly to carry out the provisions of this section provide an elaborate and systematic scheme for the distribution of the waters of the state to those entitled to their use. The state has never relinquished its right of ownership and claim to the waters of our natural streams, though it has granted to its citizens, upon prescribed conditions, the right to the use of such waters for beneficial purposes and within its own boundaries. The property right, however, in the natural streams, and the waters flowing therein, has never been renounced or relinquished by the state, and it has at all times asserted not only its right of ownership, but the unrestrained right, within its own boundaries, to

distribute its waters to those who have, under its authority, acquired, by perfected appropriations, the right to their use.

"This constitution of ours was ratified and adopted by the legal voters of the state in accordance with the conditions prescribed by the enabling act of congress, and the president of the United States in his proclamation admitting Colorado into the Union found the fact to be that the fundamental conditions imposed by congress on the State of Colorado to entitle it to such admission had been complied with. Congress, in passing the enabling act, and the President, in issuing his proclamation, were aware of the existing physical conditions and of the topography and geography of the state. The federal government, by its law-making and executive bodies, knew that the natural streams of this state are, in fact, nonnavigable within its territorial limits, and practically all of them have their sources within its own boundaries, and that no stream of any importance whose source is without those boundaries, flows into or through this state. The entire volume of these streams is therefore made up of rains and snows that fall upon the surface of lands included within the exterior lines of this state and of springs which issue from the earth within the same area. Such being the peculiar conditions, the state was justified in asserting its ownership of all the natural streams within its boundaries. When Colorado was admitted into the Union with such a constitution, the federal government, through its law-making and executive departments, thereby recognized and confirmed such right of ownership as belonging to the state in its sovereign capacity. We therefore find it to be not only that our state constitution and pertinent statutes, but the de-

cisions of the courts and duly announced public policy, all are in accord on the proposition to which the federal government has, as we have just shown, given its consent that the waters of the natural streams of this state belong to the people, to the state, in its sovereign capacity, and that its right to their distribution and control within its borders is free from any interference by any other sovereignty."

* * * * *

"The right of congress to regulate and control navigable interstate streams and the jurisdiction of the Supreme Court of the United States to determine, in a controversy between two or more sovereign states over the waters of an interstate stream, whether they are reasonably exercising their inherent powers of sovereignty, are not overlooked or questioned by us; but these considerations do not, for the reasons above stated, affect or bear upon the right of ownership and control by Colorado of its own natural streams, and its power and authority to regulate the distribution of their waters, within its own territory, for beneficial purposes."

Stockman v. Leddy, 55 Colo. 24, 27, 129 Pac 220.

and only recently the same doctrine is restated.

"Curley's title or right to the use of water of the natural streams in the State of Colorado did not come from the United States, but from the State of Colorado, which is the owner in its sovereign capacity of the water of all of its regular streams, and it is only the right to the use of the water that it permits appropriators to acquire. The water itself of all our natural streams is in the State of Colorado."

Bowers v. McFadzean, ... Colo. ....., 257 Pac. 361, 363.

II.

THE ADVANCED ADMINISTRATIVE SYSTEM AFFECTING WATER RIGHTS IN COLORADO.

As a logical sequence Colorado has had no difficulty in adopting a unique degree of state control, state supervision, state administration and what practically amounts to state diversion and state-supervised use of waters of its running streams. The principal statutes covering this development are cited in the complaint (Complaint, pages 12 to 15). They constitute practically the whole of Chapter XXXV of the Compiled Laws of 1921. Chapters have been added (Session Laws 1923, Chapters 133, 134, 135, 189, 190, 191, 192, 193; Session Laws 1925, Chapters 119, 120, 121, 122, 123, 124, 175, 176, 177, 178, 179; Session Laws 1927, Chapters 117, 118, 119, 193). The sections cited aggregate more than 500, and every one contributes to and exemplifies the extreme degree to which state control of not merely the title, but the actual use of water has been carried in Colorado.

The formal statutes, however, give only an inkling of the extent to which the state actually participates in every detail of water use on the principal Colorado streams. On the Platte River and Arkansas River particularly, the demand for water has carried the necessity for state control to a point which we believe has never been reached in any other irrigation community. The general effect is pleaded in the complaint (Complaint, pages 10 to 19). The administrative system was commented upon by Judge Brewer as early as 1906 (Kansas v. Colorado, 206 U. S. 46, 106). Its real development is within twenty years.

The details of the system should be left to await proof, but the issues here require in the first instance some familiarity with their operation. The water offi-

cials physically control every headgate and every diversion. (Colorado, Comp. Laws, 1921, sections 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1812, 1823 to 1839, etc.) The Arkansas River proper is divided into twelve districts, and the main river falls into five. (Comp. Laws 1921, sections 1851, 1860, 1864, 1911.) In each one of these districts a water commissioner is on duty day and night, supervising the administration of water. He is furnished by the State Engineer with a list of the water rights or so-called priorities within the stretch of river which he superintends. This list is so tabulated that for every given quantity of water entering his district from above he is expected to open a certain number of headgates to a certain extent if water is demanded and needed by each. This sounds in the first instance like a simple mathematical problem but as a matter of fact the junction of tributaries, the quantity of returned water becoming available in the stream at various periods of the year and in a varying degree in different sections, the relative location of ditches, rains, crops, and a score of other factors affecting the use of water make the tabulation and its use a product of long administrative experience and engineering experiment and observation. Varying degrees of moisture, rainfall, dry winds and floods upon the main stream or its tributaries keep the water commissioner almost constantly on the alert and hourly modifications of the distributions of water are made by each commissioner. The commissioner knows nothing about the priorities in the district above him, except by general information, nor of the priorities in the district below. His duty is confined to the obligation of seeing that when a certain quantity of water enters his district it is used in a practical way pursuant to the tabulations in his hands and the varying conditions, and that he permits a certain other given quantity to enter the district below. The districts are thus

administered as units. Any appropriator in the lower district who feels that he is not receiving an adequate amount of water makes a demand not upon any particular ditch in an upper district, but on his own water commissioner, and that water commissioner in turn demands water through the division engineer. (Colo. Comp. Laws, 1921, sec. 1839.) The division engineer then, if the demand is well founded, does not "cut" any particular ditch but requires an upper district to supply water as a whole. He and the water commissioner each within their spheres of action take cognizance of innumerable elements affecting the water supply and the requirements for water. Knowledge of large quantities of returned water, information of floods on tributaries and side streams which may arrive and affect the situation, guesses even at prospective rainfall or prospective melting conditions of snow brought about by sunshine, knowledge of contemporaneous river conditions which affect the quantiey of available returned water, loss from turning water into dry channels, knowledge of the use of the stream as conduit for reservoirs, of existing exchanges between ditches, are a few of a thousand factors that influence the action of the administrators. A mistake in judgment may waste a large quantity of water which is not needed when it arrives at the ditch which was short of water when the demand occurred. An overestimate of supply may cause a shortage for days ahead. A day or half a day is often consumed in the flow of water from one end of a single district to another. A week may be required to carry water through the division. A week will not measure the period during which the division engineer is required to forecast and exercise his discretion. All this elaborate machinery is aimed at the adaptation of the priority system to the extreme necessity of an arid country with a limited and varying stream supply. A disturbance of the system destroys

it. Except for such adaptation the priority system would not have survived frontier days. As all students recognize, it is wasteful in the extreme. Discretionary distribution looms in the future here as in the present in Europe.

Much of the novelty, the state socialism and the public functions of the irrigation system of Colorado are matter of oral proof and evidence of practice. The novelty of the irrigation law is indicated, however, in some of its simpler phases by cases and statutes. Dogmatic and therefore misleading as such authorities necessarily are, they show the originality and malleability of this field of vital law.

The early repudiation of the whole common law applicable to water is interestingly represented as early as 1872. Here we find the court, conscious that some new scheme must be adopted for irrigation uses in this thirsty land, fumbling at "necessity", "the law of nature", and "estoppel" to justify what has to be found lawful.

Yunker v. Nichols, 1 Colo. 551.

Gradually a new sort of property is sketched, a "water right" or "priority" or "appropriation". Contrary to any common law conception—as specifically to the Kansas cases—this doctrine permits the diversion of water beyond the valley of the stream, burdens the stream bed itself even over alien lands with the duty of carrying water privately owned, diverted and brought from elsewhere. These "water rights", though realty, are severable and transitory, unattached to any land or locality.

Oppenlander v. Left Hand Ditch Co., 18 Colo. 142 (1892), 31 Pac. 854.

Although realty in the nature of easements, they can be abandoned by mere intentional non-user and thus again the common-law is ignored and the whole continuance of the right, once acquired, made to depend on unwritten local facts. The usufruct is readily lost in a moment.

Arnold v. Roup, 61 Colo. 316; 157 Pac. 206 (1916).

These rights, so set at large, are now classified into a complexity of uses, all new conceptions. Diversion for storage, is made a separate class, junior in claim to diversion for immediate use.

Greeley and Loveland Irrigation Co. v. Huppe, 60 Colo. 535; 155 Pac. 386.

The sugar beet industry enters the state and the courts, faced with a new necessity, adapt the law and permit storage for a season under a right acquired for immediate use.

Seven Lakes Co. v. New Loveland, 40 Colo. 382, 93 Pac. 485.

The constitution classifies all rights into preferential classes as between manufacturing (power), irrigation and domestic uses, but the local conditions show that plan discouraging new projects and the courts limit the application of the Constitution.

Town of Sterling v. Pawnee Ditch, 42 Colo. 421; 94 Pac. 339.

Gradually a novel recording system ("adjudication") is evolved by slow statutory steps, based on districts or units of local use.

Sterling Irrigation Co. v. Downer, 19 Colo. 595; 36 Pac. 787.

Fort Lyon v. Arkansas Valley Co., 76 Colo 278; 230 Pac. 615.

Then the necessity of economic use writes a new condition, "water thrift" into every decree.

Comstock v. Larimer and Weld, 58 Colo. 186, 203; 145 Pac. 700.

Fort Collins Milling v. Larimer and Weld, 61 Colo. 45; 156 Pac. 140.

And the water officials, now an army, are armed with a new discretionary freedom for the public interest.

Comstock v. Fort Morgan, 60 Colo. 101; 151 Pac. 929.

The state elaborates a definite policy of state ownership, control and state responsibility to other sovereignties—

Session Laws of 1917, Chapter 151, p. 539.
Compiled Laws of 1921, Section 1618, 1619.
Stockman v. Leddy, 55 Colo. 24, 129 Pac. 220.
Lamson v. Vailes, 27 Colo. 201, 61 Pac. 231.
Session Laws of 1921, Chapters 242, 243, 245, 246.
Compiled Laws of 1921, Sections 1651, 1681.
Session Laws of 1923, Chapters 189, 190, 191, 192.
Session Laws of 1925, Chapters 175, 176, 177, 178, 179.
Session Laws of 1927, Chapters 118, 119, 193.

The foregoing review indicates clearly that there is nothing whatsoever in common between either the legal theory or the administrative conditions in Kansas and Colorado. The mere term "appropriation doctrine" scarcely suggests, much less describes, the Colorado system. It is in substance a system of state ownership of water with an elaborate machinery for parcelling out that water on the general basis of priority of utilization but actually with an extreme devotion to the principles

of economic use and social welfare. In Kansas irrigation is an incident to the prevailing system of riparian polity. There is no developed administrative machinery. Irrigation is confined to a little scattering of ditches in southwest Kansas of which the Water Association, defendant herein, is one. This group remains as a remnant only of spasmodic efforts at irrigation which has been discouraged by periods of plentiful rainfall and is marked by a long history of financial difficulty and lack of popular support. As Justice Brewer said in 1906 (Kansas v. Colorado, 113), "at one time there were some irrigation ditches in these western counties which promised to be valuable in supplying water and thus increasing the productiveness of the lands in the vicinity of the streams and it is true that those ditches have ceased to be of much value, the flow in them having largely diminished."

It thus appears that Kansas and its counsel were right in 1901 in contending that there was no similarity of conditions or doctrines in the two states. This contention was sustained by this Court. It is even more markedly true today that another generation of intensive irrigation law and administration in Colorado. This fact distinguishes the situation between Kansas and Colorado altogether from the situation in Wyoming v. Colorado and from the private western cases which have tended to recognize priorities as such, regardless of state lines. As between states with such divergent physical conditions, legal policies and administrative development the disregard of state lines would seem to us the gravest mistake. If Kansas is entitled to water for its group of irrigation ditches, that water should be exacted from Colorado as a whole. Colorado pleads earnestly that it is unnecessary and unstatesmanlike to require it both to surrender its water supply and forfeit its legal and administrative system.

III.

THE ECONOMIC AND POLITICAL PRINCIPLES IN THE COLORADO WATER SYSTEM.

In the course of contrasting conditions in Kansas and Colorado, we have already developed some description of the Colorado conditions and therefore necessarily of the theories lying behind those conditions. There is, however, a conscious economic and political philosophy involved in the Colorado system which deserves attention.

Colorado was admitted to the Union with the full functions, powers and opportunities of the original thirteen states (Kansas v. Colorado, 185 U. S. 125, 143). As such, it had the duty of describing its property rights, administering them and, so long as it preserved a republican form of government, it had and has freedom to divide its social machinery between private and individual functions as it sees fit. It could, if it chose, have made all transportation, for example, a function of the state itself. It could have made irrigation altogether a state activity and in the course thereof forbidden agriculture through irrigation, except by and through state officers. It could have abolished the inherited common-law conceptions of both real and personal property. It was a sovereignty and, except as limited by express provisions of the Federal Constitution, it controlled the lives, the movements, the property and the activity of its inhabitants. In the field of irrigation it has actually exercised almost the full freedom of this sovereign power. Its irrigation doctrine involves abandonment and negation of the principal traditions of the common law. It has established a policy of state ownership of flowing water in direct contrast to the common law conception It has obliterated the rights of riparians, made the use of water dependent in the first instance upon priority

of utilization in point of time and finally classified even these priority rights into domestic irrigation and manufacturing uses and again into direct use and indirect or storage use. It has invented a system of statutory adjudication binding upon its citizens and the individuals affected, which would be incomprehensible to the common law jurist. It considers its irrigation priorities real property and in the nature of temporary easements, but provides that these may be abandoned under circumstances unknown to the law of easements and that these rights though conveyable by deed are not subject to the statute of frauds. It has invented and qualified an army of engineers and water officials unknown before in history. In short it has used its sovereign power not merely to reform the law of water, but to exercise itself the real ownership and utilization of its water resources. All this is a product of its necessity, of the state's dependency for life and civilization upon the thin streams of liquid that arise within its borders. The other western states in their irrigation developments are only pale reflections of the Colorado history and system.

Another traditional principle is involved. The principle of local government and local administration is represented in this water system. The gradual evolution of an irrigation system from one or two statutory sections adopted at the first legislature to the complex modern aggregate is nearly all written in the terms of two movements: first, increasing local control and, second, the increasing application of physical science. Local control is represented by the irrigation districts, with local officers, locally paid, locally selected, locally trained and concerned wholly with the local division and supervision of the flowing streams. These officers are made the representatives of communities or districts in their dealings with other communities and districts, and local familiarity with conditions, and local loyalty, and their

responsibility to local influences all are part of the theory.

The last movement or element in the picture is that of modern science. Fifty years of stream study, stream measurement, meteorological forecast and agricultural science have combined together to produce a system which gets the maximum results from its water resources. This is no place to elaborate upon the details of these conditions. Their extent can perhaps only be realized by watching the daily operations of the irrigation officials in Colorado.

Any recognition of the individual claims to water in Kansas as against individual ditches in Colorado will be an obliteration of the unity built up by these three principles of American progress. Any recognition across state lines of the claims of individuals in Kansas against individuals as such in Colorado will be a negation and a practical destruction of the doctrine of state sovereignty, local government and the utilization of modern science as applied to the water resources of this new western community.

IV.

THE LITIGATION IN KANSAS v. COLORADO, WHAT IT INCLUDED AND WHAT IT SETTLED.

As appears in the complaint, the State of Kansas, in 1901, brought suit against the State of Colorado in regard to the flow of the Arkansas River, and after a preliminary opinion on motion to dismiss, the case went to proof and the action was concluded in May, 1907, by a long and important opinion of the Supreme Court.

Kansas v. Colorado, 185 U. S. 125; 206 U. S. 46.

One judge took no part in the discussion; eight of the judges agreed in the conclusion, and six in the opinion. There was no dissent. This opinion has been treated by both sovereignties up to the present hour as a settlement to its date of all controversies affecting the river between the two States and their inhabitants. So far as we know, the only dissent from that view has been represented by various efforts of individual ditches in Kansas, as recited in the complaint, to ignore that adjudication and that decree, and sue to enforce alleged individual priorities to water across the state line without regard to the sovereignties involved. If the original litigation, as we believe and have relied upon, settled the controversy to the year 1907, the whole argument of the defendants made in their brief in the Motion to Dismiss fails.

The origin of the case of Kansas v. Colorado is of more or less familiar Western history. It is well known that the case originated as the result of the demands of the small group of ditches in southwestern Kansas that their sovereignty should proceed actively to present their grievances against the Colorado ditches. The case, while in its general terms a suit in behalf of Kansas at large, was actually initiated and carried on by and in behalf of the colony of old ditches referred to above by Judge Brewer. (206 U. S. 103, 117.) It will be noted that a main part of the argument was carried for Kansas, aside from its Attorney General, by Mr. F. Dumont Smith, who now appears again for the same interests.

After the filing of the bill on May 20, 1901, Colorado filed a motion to dismiss, which was overruled April 7, 1902.

Kansas v. Colorado, 185 U. S. 125.

The bill as abstracted in that decision, as well as in the original full text, reveals that the complaint was made by Kansas only incidentally in her capacity as an individual proprietary owner but primarily, as the opinion states, "as representing and on behalf of her citizens" (p. 142), and the bill, the Court said, "seeks relief in respect of being deprived of the waters of the river accustomed to flow through and across the State, and the consequent destruction of the property of herself and of her citizens, and injury to their health and comfort." (Opinion, p. 142.) The Court points out that the complaint against Colorado is of "state action and not the action of state officers in abuse or excess of their powers." (Opinion, p. 142.) The Court points out that the case is substantially an international conflict in which each state asserts the right of self-preservation, that each state has dominion over all things within its territory, and that the action will be settled on the basis of international law applicable between sovereignties appearing each in the capacity of *parens patriae* as the representative of all its citizens and inhabitants and as the source of all property rights within its jurisdiction. The Court says:

> "The gravamen of the bill is that the State of Colorado, acting directly herself, as well as through private persons thereto licensed, is depriving and threatening to deprive the State of Kansas and its inhabitants of all the water heretofore accustomed to flow in the Arkansas River, through its channel on the surface and through a subterranean course, across the State of Kansas. * * * Injury, it is averred, is being, and would be, thereby inflicted on the State of Kansas as an individual only and on all the inhabitants of the state, and especially on the inhabitants of that part of the state lying in the Arkansas Valley. The injury is asserted to be threatened, and is

being wrought, in respect of lands located on the banks of the river; lands lying on the line of a subterranean flow; and lands lying some distance from the river, either above or below (sic) ground but dependent on the river for a supply of water."—(Opinion, pages 145-146.)

The Court suggested certain inquiries of fact and overruled the demurrer without prejudice. Kansas amended its bill by joining sixteen of the Colorado corporations, as large diverters of water from the Arkansas River within Colorado. The United States attempted to intervene, but was finally dismissed. From 1903 to 1906 was consumed in the taking of voluminous testimony. This testimony covered not only all the recorded facts in regard to the flow of the river, ranging from extracts from the earliest travelers such as Lieutenant Pike, to the most recent engineering data, but also recounted in detail the history of irrigation in both states, the names and location of all the ditches and other diverting structures, the dates of their births and in some cases of their deaths, the quantity of water used, and the acreage on which it was applied. Every demand for water in either state and every effort to employ it, and the effect of every enterprise will be found elaborately pictured in the voluminous printed testimony. There can be no doubt but that all the parties concerned, both States and the Court, believed they were adjudicating an international controversy whose decision would settle and include the derivative claims of all inhabitants and property holders in either State. On May 13, 1907, as above indicated, the Court, through Mr. Justice Brewer, himself a citizen of Kansas, held that Colorado was limited by equitable considerations to a reasonable exercise of her sovereignty in the creation of property rights and the use and exhaustion of the waters of the Arkansas River; that her claims to exhaustion of the flow of the river within her own boundaries could not be sustained, that

the activities of her citizens had resulted in substantial depletion of the flow in Kansas and material injury to Kansas irrigation enterprises, but that, in view of the relative needs and conditions in the two states, Colorado had not so far exceeded the equitable limitations on the exercise of her sovereignty.

Kansas v. Colorado, 206 U. S. 46.

Citations in detail to the testimony, arguments, and the opinion, directed at showing the extent to which the operation and irrigation rights of the citizens of both States were examined and considered, would be so voluminous as to be unprofitable here. There is scarcely a page of the testimony of the printed oral arguments or of the opinion which does not bear more or less on the fact that the Court was adjudicating the claims of the citizens of both States as well as the more or less nominal property rights of the sovereignties themselves. The injury to the irrigators in Kansas was pleaded, dwelt upon by Kansas and proven (206 U. S. 51, 52, 55, 57). As already noted, a number of Colorado ditches were made defendants, and actively participated and resisted. As already noted, the opinion specifically mentions the claims of and injury to the series of ditches in southwestern Kansas of which group the present Water Users' Association, defendant, is a member. (206 U. S. 113, 114, 117.)

At the conclusion of the case the Court dismissed the bill of Kansas, reserving jurisdiction, however, to re-open the litigation if subsequent diversions by Colorado should destroy the equitable apportionment of benefits between the two states. This permission to re-open was given to Kansas the sovereign, and to Kansas alone. In the words of the Court, "the decree will also dismiss the bill of the State of Kansas as against all the defendants, without prejudice to the right of the plaintiff to institute new proceedings whenever it shall

appear that through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river." (206 U. S. 117, 118.)

No reasonable or unprejudiced lawyer or layman can examine this litigation without being convinced that both states were representing and staking all their rights, all those of their citizens, and all the property claims within their borders. Such was the natural implication in the bill of complaint filed by Kansas and the treatment of the case by the Supreme Court as a conflict between sovereignties. (206 U. S. 97.) Such undoubtedly was the conception of all the parties concerned as to the issues presented and tried. If Kansas was not asserting and litigating the claims of its irrigators, what was she asserting and litigating? The property rights of the State of Kansas itself as an ordinary proprietor were negligible in quantity, and are so treated by the Court. (206 U. S. 98.) The actions of Colorado complained of were not to any appreciable degree the assertion of water use and water rights by the State in a proprietary capacity but were expressly stated as the operations of Colorado through its citizens and corporations engaged in the diversion and use of the waters of the river for irrigation and other beneficial purposes. (206 U. S. 52.) If these irrigation rights in Kansas and Colorado were not the source and subject of the litigation, and not bound thereby, who or what was bound? If Kansas had no right to represent and bind the property rights of its riparian owners who were irrigators, did it have any more right to assert or bind the property rights of its riparian land owners using water for older uses? Both classes of property were derived from the State, defined, administered, and reg-

ulated by it. Both indeed were, under Kansas' own theory, merely different forms of exercise of the riparian property conception. (206 U. S. 51, 52, 59.) If the claimants who now style themselves as appropriators were not bound and foreclosed by this decision to the date of its adjudication, there is no reason to think that the rights of the ordinary riparian land owners were concerned or bound. If neither of these classes were involved or adjudicated, we have left only the small proprietary claims of the two States themselves. These were small in relative quantity and, as already indicated, were neither much treated by the litigants or more than cursorily referred to by the Court. If only the proprietary rights of the State of Kansas were involved, there was no occasion for granting Kansas leave to reopen the case. If the litigation in Kansas v. Colorado did not determine and conclude the claims of all property owners and inhabitants of both States, it was as empty a legal farce as the law can be accused of having enacted.

The later adjudications of the Supreme Court upon the same subject, however, quite confirm our view. In Wyoming v. Colorado, for example, in 1922, Wyoming adopted the same theory as that represented in Kansas v. Colorado, and we find the Supreme Court interpreting Kansas v. Colorado (p. 646) as a proper precedent for the litigation between Wyoming and Colorado. In that litigation no use of water except under appropriations was in evidence. The States again assumed to act for their respective citizens and property owners, and the adjudication is in complete conformity with this theory. It actually parcels out the river between the two States not only for the benefit of their respective appropriators but with the needs and requirements of the appropriators as a guide and a consideration.

Wyoming v. Colorado, 259 U. S. 419, 464, passim.

If Kansas v. Colorado did not bind the citizens of each, then Wyoming v. Colorado is an equally negligible performance. We contend that the litigation in Kansas v. Colorado, if it represents anything at all, is a determination of the following facts and conclusions:

(1) That up to the date of the adjudication the diversions and use of water in Colorado, including all of the acts, rights and claims of all the corporations, citizens and public agencies within the State of Colorado, had not exceeded the lawful assertion of Colorado's sovereignty and right to control and use the river.

(2) That up to the date of that adjudication, although numbers of citizens of Kansas had been damaged in fact in various ways and particularly the groups of ditches in southwestern Kansas already referred to had been substantially damaged and perhaps destroyed, Kansas and its citizens had no grounds of legal action as the injury brought about by Colorado was within the scope of its property and natural rights.

(3) That inasmuch as Kansas had treated the matter as one of state concern, it would be so treated and the rights of the citizens and property owners of both states would be merged in, involved in, and concluded by, the proceedings by their respective sovereignties.

(4) That inasmuch as the decision was necessarily based upon the claims of the two States as a whole, and inasmuch as the effect of the decision was to allocate to Colorado at least a minimum quantity of water and a minimum quantity of control represented by the then existing extent of the diversions from and depletions of the river flow in Colorado, and inasmuch as the entire subject is justiciable only as between the States themselves, any future adjudication, negotiations or allocations between the two States must continue in the same form, namely, as between the sovereignties as a whole.

(5) That inasmuch as litigation between states can proceed only in the Supreme Court of the United States, none of these matters is within the jurisdiction of any other court.

(6) That to permit private litigation between claimants on opposite sides of the state boundary line would simply mean that the status already fixed by the Supreme Court as between the states themselves would be destroyed and the use of water in Colorado definitely approved in quantity by the Supreme Court as against Kansas claimants, could be frittered away and piecemeal vanish.

(7) The privilege granted specifically to the State of Kansas in the final decree to reopen the case was the natural and obvious result of the law of the case itself, and precludes the thought that any individual can bring suit to assert any claims controlled by the question determined between states. No such procedure is even mathematically possible.

V.

THE INAPPLICABILITY OF VARIOUS DECISIONS RECOGNIZING PRIORITIES REGARDLESS OF STATE LINES.

The defendants cite a number of adjudications in which the courts have permitted litigation between appropriators in different states and enforced the claims of the appropriators in a lower state against appropriators in an upper state on a stream flowing from the latter to the former. There are such decisions, and we recognize that they represent at least part of the law applicable to interstate streams. We shall not attempt to discuss all these cases in detail. They are all obviously decisions reached in order to permit a settlement of an awkward individual controversy

which might otherwise be hopelessly entangled in international relations. All assume the acquiescence of the sovereignties involved. None denies these sovereignties, or discusses the issues here presented. None involved controversies in which the laws of the respective states were brought into conflict. All but one are private litigation.

The case of *Wyoming v. Colorado*, (supra) not particularly relied upon by the defense but cited by them, is perhaps the most significant of these decisions. In this case Wyoming sued Colorado, as did Kansas, in behalf of all her citizens and property owners, but the crisis and cause of the suit was a threatened large single diversion from a comparatively small watershed in Colorado which diversion had not yet become fully operative. Mr. Justice Van Devanter, for the Court, in the course of the opinion, stated that the same general doctrines as were applied in *Kansas v. Colorado* respecting the rights of the two States to sue for and represent the derivative claims of their inhabitants controlled the situation. He pointed out, however, that, unlike the situation in *Kansas v. Colorado*, in which Kansas was a riparian state and Colorado asserted the appropriation doctrine, here both States were alike in doctrine, both Wyoming and Colorado having repudiated the whole riparian system. (259 U. S. 464, 465). He then said that, under these circumstances, the relative priorities in the two States would be a guide to their respective claims upon the river. He points out that the courts in several cases have protected priorities regardless of state lines. He goes no further, however, in his own argument and conclusion than to indicate that the relative priorities, that is to say, the dates and quantities of the actual irrigation development in the two States, should be a guide to an equitable allocation of the waters of the stream between the two States. The decree itself

is in no sense a recognition of priorities regardless of state lines. It does not designate or protect any individual appropriations; it does not, as the appropriation doctrine requires, decree that the water shall be applied to the various ditches in the order and amount of their relative construction and utilization of water, but, on the contrary, determines that Colorado shall permit to flow over the state line each year a given quantity of water measured in acre feet. Wyoming is held bound to develop reservoirs and other irrigation projects—a state activity and not a priority conception. The distribution of this water in Wyoming is left to the Wyoming law and the Wyoming machinery. The question of what claims in Colorado may be affected or negatived by the operation of the decree is left to the laws and machinery of Colorado to determine and enforce. The controversy is treated as one between states. The allocation of rights is made as one between states. The relative priorities are referred to only for the purpose of indicating a system of adjudging the equitable claims of the two States as a whole upon the flow of the river. In short, the decision is in complete accord with the opinion and conclusion in Kansas v. Colorado except that it inserts one additional idea into the formula, namely, that where both states have committed their streams to a policy of utilization based on priority in time, that same priority or utilization in point of time may be considered as a guide towards the allocation and delimitation of their respective sovereign rights in the flow of the stream. There is not the slightest tendency in the case to infringe upon the sovereignties of either state or to make war upon their domestic theories and policies.

The other decisions cited by counsel in our judgment have little application to the case at bar. In the first place, none of them involves a situation such as

that upon the Arkansas River in which a prior adjudication between the states has committed both states to a doctrine of adjudication between the states as a whole. In none of them has there been any compact or legal adjustment between the two states as such. In none of them has there been any long-fought litigation such as has occurred in the Arkansas River which has led to or even approached a settlement and determination of the relative rights on the two sides. In the second place, not only is the element of a prior adjudication lacking, but the states themselves were not at any time impleaded in these cases. The cases are simply instances of private litigation involving no state conflict. In the third place, in none of those cases was there involved elaborate state policy, state unity, state sovereignty and state control such as now appears for the first time asserted by Colorado in this court. Fourthly, in none of these cases of individual litigation has there existed in either state the elaborate and complicated economic system now in effect on the Arkansas River. In all of them the conflicts were local, on local streams, confined to small quantities of flow, small acreages, and limited geographical areas. The situation on the Arkansas River is almost unique in the extraordinary length of the stream, in the immense geographical area involved, in the high development of administrative machinery in Colorado, in the acuteness of utilization, and the intensity of scientific control to which Colorado has developed its system of water distribution. Fifthly, in none of these private cases was there any conflict between the laws of the respective states under which the claimants deraigned their titles, nor was there any necessity for the trial court to determine the rights of the states themselves or to adjust basic questions concerning the extent of the exercise of their sovereignties. Finally, we respectfully suggest, since the decision of most of these cases, the sovereignties of the Western States are awake to their

political responsibilities and the dangers to their unity involved in the elimination of state lines. As shown in the complaint, the West is alive with a desire to treat the problem of interstate streams by the means of state compacts and on the basis of the States as units. For the first time the threat of important development on the Colorado, the Platte, the Arkansas, and numerous other streams has awakened all the States concerned. They now have diplomatic corps, they are negotiating as independent sovereignties, and they are struggling on the floors of Congress itself to protect and maintain the control of their natural resources. All of this is a new development in the scene of western irrigation law. It is an awakening to political and social realities which were forgotten in the haphazard days represented by these first fumbling treatments of water rights on interstate streams.

It will be noted that the rule in *Kansas v. Colorado* was laid down with most of the private cases ignoring state lines already decided at that date, and cited in briefs. The argument that these cases can overcome *Kansas v. Colorado* or that individuals can proceed under them in spite of an adjudication between their states applies, of course, also to interstate compacts. Compacts become futile also, if this argument is followed.

VI.

EFFECT OF ADJUDICATIONS BETWEEN INDIVIDUALS.

If the foregoing description of the legal policy, the administrative system and the economic conditions in Colorado, and the foregoing statement of the content and effect of the adjudication of the Supreme Court in Kansas v. Colorado are correct, it would follow that Colorado is entitled to take the following positions:

(a) *States necessary suitors.* That the litigation in Kansas v. Colorado committed both the sovereign States of Kansas and Colorado and the treatment of their respective claims to the flow of the Arkansas River on the basis of the States as units; that Kansas is estopped both by the doctrines asserted in that suit and by the very fact of commencing the suit from instigating, permitting or even justifying litigation between indivduals who derived their rights from her; that Colorado not only, by the effect of that suit but by her settled legal and political policy in respect of waters, is equally committed to the same attitude.

If the adjudication in *Kansas v. Colorado* has any of the traditional significance of either ordinary domestic litigation or of the international treaties which the adjudication in the Supreme Court was intended to replace, it has resulted in the determination of certain principles governing the rights of the two States. Each State assumed the position and now is to be treated as the responsible parent, source, and origin of all property rights in water within its borders, and the directing authority for the administration and exercise of those rights and the utilization of water in pursuance thereof. Kansas asserted Colorado's responsibility for the situation, and Colorado admitted and justified that responsibility. The property rights of private individuals and the activities of private individuals were treated as being controlled by and as being purely derivative from and subject to the usual respective sovereignties. There was no suggestion by either side that the States were not the sources of and in control of the situation.

(b) *Prior Adjudication.* That the litigation in *Kansas v. Colorado* resulted in an adjudication to the effect that the extent of Colorado's use of the water and the diversions and depletions connected therewith were valid to the date of that litigation. If the Supreme

Court in its international capacity is in any respect a court and not a mere temporary pacifier, these consequences would seem necessarily to follow. The adjudication therefore amounted to a finding that Colorado as a whole was entitled to use the river and to deplete it in the course of its domestic policy to the extent that such depletion and utilization had been carried to the year 1907 (or whatever proper date is judicially applicable to such a judgment), and she was in effect quieted in her possession and use of the water to that extent. This is the undoubted effect of the dismissal of a suit in equity according to the ordinary rules applicable to equity litigation, and it is accentuated by the express statement of the Court that the dismissal was subject only to the freedom left the State of Kansas to re-open the cause if and when she felt new facts subsequent in time had materially altered her situation. It would seem, therefore, that Colorado was entitled to rely upon that decision as an interstate settlement permanent in degree, and that she could thereafter continue within her borders to use as she saw fit the quantum of water available to her and to divide and license it among her farmers and citizens. She has undoubtedly relied upon this situation; the decree is now more than twenty years old.

If, therefore, Colorado was adjudicated this quantum of water or quantum of freedom, and left to dispose or modify the disposition of her own resources within these limits, any subsequent modification of or additions to or subtractions from such quantum would seem necessarily to involve the two States in their sovereign capacities. Surely, in the absence of Colorado, Kansas could not, by suing private individuals in Colorado, justly or effectually alter the old adjudication; surely private individuals as between themselves in the two States could not assume to alter or modify what belonged not to them but to their sovereignties.

Either State may, even now by the exercise of its sovereignty, whether by eminent domain or within the police power, substantially re-cast its whole system of internal rights. Not only the freedom to do that would be destroyed by private litigation but the exercise of the rights allocated to Colorado would be affected by such private litigation. Colorado is in a sense the trustee of a fund towards which its citizens stand as beneficiaries, and Kansas also bears some such analogy to its subordinate property holders. Litigation between the beneficiaries cannot, in domestic law, affect the fund without the presence of the trustees, nor has one beneficiary of the fund a claim against the beneficiary of another fund, though each, through their trustees, may derive benefits from proper litigation between the trustees. Such rules are familiar and necessary principles of any orderly law.

(c) *State ownership in Colorado.* That Colorado has by proper domestic policy made its water essentially a subject of State ownership and State administration, and the property rights which it has created are derivative and usufructuary only. To use a common law analogy, Colorado owns the fee. Her inhabitants are licensees of rights transient in nature, easily abandoned, even somewhat discretionary in application. If this is the domestic policy of Colorado, born of her own necessities and developed through a series of crises in her own history, Colorado is entitled, even had there been no previous litigation, to insist upon being impleaded whenever the use of the waters of the Arkansas River is concerned.

(d) *State administration in Colorado.* That Colorado has developed a legal system and administrative procedure which is a unit in itself. This machinery is delicate, complex, and interwoven with elements of discretion, engineering, and modern science. It consists of

groups of units called districts which, in actual operation, concern other units or districts, and the elementary conceptions of the appropriation doctrine are subordinated to this machinery. The destruction of these units by inserting either individual responsiblities and adjudications across district lines or across state lines, or by inserting arbitrary judicial rulings regardless of district lines or state lines, or of writing across the face of the statutes new interrelations not contemplated by the system, or thrusting into the regiment of its officers a new and foreign group of court marshals or commissioners would be each destructive of this system. With the system would fall not merely the sovereignty and integrity of the State and its policy, but also the economic and efficient use of its waters, the fruits of its experience in water administration, and the added value to a limited water supply which science, experience, and system can contribute.

(e) *Colorado policy of State responsibility.* That Colorado, furthermore, is by legislation and judicial decision definitely committed to a policy whereby it alone assumes responsibility and leadership in the control of its water resources, whereby it expressly forbids the recognition by any individual or officer of rights or claims outside its boundaries, and whereby it insists that its relations with neighboring states should be treated as matters between sovereignties. This conception of the obligations and policy of the State is in thorough accord not only with the traditional views of Anglo-Saxon government, not only with the conception of the uses and activities of states in the Federal Constitution, but most noticeably with the developed views of the other Western States. Whatever may be the situation in the smaller and crowded communities East of the Alleghenies, this Court is conscious that the Western States are social units, awake to the value and

usages of state rights, and eager to deal among themselves as the representatives of their peoples.

Will private litigation militate against any or all of the foregoing legal conclusions and policies? The Complaint, in paragraph fifteenth and elsewhere, tries to point out some of the consequences of such private litigation. In the pending cases in the United States District Court for Colorado the defendant has selected in one case seventeen and in the other about one hundred and twenty individual priorities for attack. There are more than four thousand such priorities adjudicated on the water system of the Arkansas River. (Complaint, supra.) The small percentage selected for attack are scattered through numerous water districts, numerous counties, located in different climatic zones, and so widely separated geographically that they have no mutual contact and little mutual consciousness. The owners of water priorities on the Arkansas River seldom have any relations with other priorities except within their own water district and with their own water commissioner. They know in the vaguest way only of what priorities exist outside their district, and even of the water supply of other districts. They know practically nothing contemporaneously of the diversions and river conditions existing from day to day in other districts. Occasional suits seeking permanent, not administrative, readjustments are the only exception. The adjudication of the United States District Court, for example, that the city of La Veta, located on a tributary of the Arkansas River one hundred miles from the main river and three hundred miles from the plaintiff in Kansas, should recognize the priority in Kansas would be either meaningless and ignored, or else throw the whole administrative system into a state of virtual paralysis. The city of La Veta has no idea whatsoever of what water is entering Kansas to-day, and if it closed its own head-

gates this morning the chances are that the effect would not be measurable twenty miles below, much less measurable at the state line. If a definite quantity of water must be supplied in Kansas, it can be supplied only by the unity and organized effort of the Colorado water officials, with each unit called upon to contribute its share, and to transmit the share received from above. The combined observations of the daily alterations and climatic conditions and stream flows from a watershed larger than many whole states must be compiled for a single brain and the effect of any action imagined and forecasted from day to day. Undoubtedly the United States courts or, indeed, any court can paralyze this system. No court can make it effective. No court can do anything else than destroy the control of the State and waste the water resources of a river upon which some 200,000 people are directly dependent. No court can do anything in the premises without considering, or adjudicating without consideration, the rights and policies of the State itself and the future guaranteed to it by the litigation in *Kansas v. Colorado.*

VII.

TECHNICAL PROPRIETY OF THIS PROCEEDING AND REMEDY SOUGHT.

As indicated at the opening of the brief, few analogies would be anticipated in the field of domestic law useful in connection with an interstate situation like the present, arising only because of the effect of the Federal judicial system. In one or two river cases the Supreme Court has discussed and confirmed the position taken by Colorado in this case, to the effect that it is entitled to dictate its own domestic policy in regard to property rights and to control its own natural resources. None of these cases, however, approach the particular

problem as closely as *Kansas v. Colorado* and *Wyoming v. Colorado*, already cited, but several of them deserve mention.

In *Hudson County v. McCarter*, 209 U. S. 349, in 1908, the Supreme Court upholds a New Jersey statute (copied in Colorado) forbidding the exportation of water from the State of New Jersey to other states, and elaborates on the principle and extent of state control of its natural resources.

In *Trenton v. New Jersey*, 262 U. S. 182; *Newark v. New Jersey*, 262 U. S. 192 (see the same subject in the lower courts, 10 Fed. (2d) 519, 526); the Supreme Court again adverts to the power of a state to control its water supply, divert it as it sees fit, delegate the right to other governmental agencies, and limit or destroy those agencies as it sees fit.

In *Foster v. Neilson*, 2 Pet. 253 (1829), the Court points out that on a question of sovereignty the domestic courts of a government should follow that government's contention as to its policy, and that they are not concerned with the political theory or domestic practice of a sovereignty. The lower Federal Courts are purely domestic courts, at least where jurisdiction rests upon diversity of citizenship, as in our cases.

In *Luther v. Borden*, 7 How. 1, the Supreme Court, on similar issues, declares that the Federal Court should follow the state courts on internal political issues.

In *Snyder v. the Colorado Gold Dredging Co.*, 181 Fed. 62, 65, Justice Van Devanter as Circuit Judge comments on the right of the state to develop its own legal water system.

Besides *Kansas v. Colorado* and *Wyoming v. Colorado*, there are several cases in the United States Su-

preme Court in which the states themselves have come into collision regarding the use of interstate streams.

In *Missouri v. Illinois*, 180 U. S. 208; 200 U. S. 496, concluded in 1906, Missouri sued Illinois and a municipal sanitary district, alleging that the defendant state was polluting the waters of the Mississippi River. The case was brought on the theory that Missouri was threatened by governmental activity in Illinois, which is the responsibility and theory accepted by Colorado in the present litigation. Missouri was permitted to sue in order to protect the general welfare of its citizens. The injunction was denied, and Chicago permitted to continue its operations on the merits.

In *Tennessee v. Arkansas*, 249 U. S. 588 (1919), Tennessee sued Arkansas to prevent levee improvements which resulted in flooding lands in the plaintiff state. The bill was dismissed for want of equity, on the ground, however, that the incidental damage arising from river improvements of this sort was *damnum absque injuria*.

In *North Dakota v. Minnesota*, 263 U. S. 365, the plaintiff state sued to enjoin a system of drainage districts constructed by the authority of the defendant state on an interstate river. The Court holds that where a state by changing drainage increases the flow of an interstate stream beyond its natural capacity so as to flood farms in another state, the latter has an interest as a sovereign or quasi-sovereign in the comfort, health and prosperity of its citizens, and may procure relief by injunction.

In *Wisconsin v. Illinois*, 270 U. S. 634, 271 U. S. 650, and *New York v. Illinois*, both of which cases seem to be still pending, the plaintiff States sued the defendant Illinois and the Chicago Sanitary District to enjoin diversions of water from Lake Michigan which threatened to affect the water level of the Great Lakes and the

flow of the St. Lawrence River. The right to sue in both these cases seems to be recognized, but the cases have not yet reached a conclusion.

The other cases on original jurisdiction have considerable collateral bearing.

In *Georgia v. Tennessee Copper Co.*, 206 U. S. 230, Georgia was permitted to sue on behalf of its general welfare to enjoin the discharge of noxious copper fumes across the state lines, thus protecting the injury of its forests and possibly of the health of its inhabitants. The Court remarks that the state property involved is a mere make-weight, and the essential issues are those of general public welfare.

In *Pennsylvania v. West Virginia* and *Ohio v. West Virginia*, 262 U. S. 553, and 263 U. S. 350, West Virginia and its officers were enjoined from enforcing an act limiting the export of natural gas which was already established in interstate commerce. The case, while decided by a divided court and arising principally on elements of interstate commerce, permits the plaintiff state, in the protection of its general social and business activities, to enjoin the activities of another state which threatened the general welfare.

The Supreme Court seems (since its first timid beginnings) to have considered that its judgments entered in suits between states were binding adjudications, as they naturally would be if entered in the exercise of the judicial power.

Virginia v. West Virginia, 206 U. S. 290; 246 U. S. 565, 591 ff.

Gordon v. United States, 117 U. S. 696.

Proceedings of the American Society for Judicial Settlement of International Disputes (1915), page 47 following.

Litigation between sovereignties as to the extent of their jurisdiction binds each state and all derived property.

Oklahoma v. Texas, 256 U. S. 70, 85.

The foregoing cases represent the general character of the previous litigation between states on subject-matters similar to our own and the general doctrines arrived at.

The present case is brought against the State of Kansas and a citizen thereof to enjoin the prosecution by that citizen or other citizens of Kansas of litigation which we consider in effect litigation against the State of Colorado or at least destructive of its sovereignty and inconsistent with its adjudicated rights. While the analogies of domestic law are somewhat limited in a controversy of this scope and character, a few familiar doctrines may be cited.

(a) The suit between individuals complained of, pending in the United States Court of Colorado, or similar suits which will certainly arise if these are permitted to continue, are substantially suits against the State of Colorado. As already outlined, the rights of the State of Colorado are substantially affected, and a decree entered in behalf of that Colorado will be infringed. The acts complained of are actually state acts, and suits of private individuals against a state are, of course, forbidden. While, under the doctrines of a number of cases, state officials can be sued where they are acting in excess of authority or under unconstitutional laws (for example, Ex parte Young, 209 U. S. 123), these cases should be carefully distinguished from the instances in which suits are brought against officials who are acting under the lawful authority of their sovereignties. State officers

cannot be sued nor their operations enjoined where they simply obey the state's command.

Louisiana v. Jumel, 107 U. S. 711;
Hagood v. Southern, 117 U. S. 52, 69;
Madrazo v. Georgia, 1 Pet. 110, 7 Pet. 627;
Harkrader v. Wadley, 172 U. S. 148, 169;
Pennoyer v. McConnaughy, 140 U. S. 1.

There can be no claim that the acts of Colorado, its legislation or its policies, aimed at confining its water within its own boundaries, are unconstitutional. No provision of the Federal Constitution forbids anything of the sort. The limitations that lie upon Colorado are equitable limitations arising out of international law and the natural relationship of states not positive or even constitutional in character. As between separate sovereignties such, for example, as Great Britain or France, these limitations are not recognized by domestic tribunals until or unless they are embodied in treaties or agreements. They then become part of the domestic law. As between states in the United States, the obligations between them in respect to the utilization of their natural resources are settled either by compact with the permission of Congress or by adjudication of this tribunal, the Supreme Court. It would seem to follow, therefore, that the acts of the officers of a state in pursuance of such domestic policies are lawful and in every respect entitled to credit by every domestic tribunal, and the lower Federal Courts among them, as the valid and effective proceedings of a sovereign. Only in this Court can a State be held to account. Only in this Court, as, for example, in Pennsylvania v. West Virginia, supra, can the officers of a state be enjoined from operations in which their sovereignty is actually the moving force. We have already indicated that the acts complained of on the Arkansas are state acts, performed by officers of the State, and for which responsibility is assumed by the

State. The situation was recognized by the fact that in the first litigation (Complaint, pages 27-28) the State officials were joined by the Kansas Ditch and afterwards by order of court dismissed in order that jurisdiction of the District Court might not be destroyed. In other words, even the District Court in that case recognized that the acts of the officers were in pursuance of a lawful State policy. It would seem to follow, therefore, that however indirectly the present claims of individuals in Kansas may be asserted, the plaintiffs therein are in effect complaining against the official action of Colorado, that the Colorado policy and administrative system is directly involved, and that Colorado itself is the actual and effective defendant.

The question of whether a suit is brought against a State will be determined not on the nominal parties but on the substantial interests and policies involved.

In re Ayers, 123 U. S. 443;
Ex parte New York, 256 U. S. 490, 500.

(b) *Analogies.* The ordinary analogies of private law would prevent a suit of the sort now sought to be enjoined if attempted to be brought. The States, if nothing more, are at least the trustees and repositories of their natural resources, entitled to administer, to defend and to protect those natural resources, and to distribute them to their citizens as they see fit. They are in a sense, therefore, the trustees of a fund. This is surely the result of the adjudication in *Kansas v. Colorado.* It is elemental law that the beneficiaries of an estate or trust fund will not be permitted to sue a stranger (as another trustee or, even more, the beneficiaries of another trustee), without the presence of the trustees themselves. Only the failure of the trustees to act will excuse such a proceeding. The reason is clear. Confusion, a mass of conflicting decisions, and the

destructiveness of the very idea of the difference between principle and derivative interests would follow.

Perry on Trusts and Trustees, 6th Ed. Sec. 877, 886.

"*Trusts*," 39 Cyc. 612.

If, as we deem it, the rights of citizens in both states are purely derivative, the same consequence would seem to follow. If Colorado and Kansas can, by the exercise of their sovereignties, destroy and re-distribute property between their inhabitants; if Colorado, as indicated, has created what amount only to transitory and usufructuary rights, most intangible and vague in quality, litigation between the holders of such derivative rights, and particularly litigation between the holders of one form of derivative right in Colorado and another form in riparian Kansas, would seem contrary to the whole policy of the law.

(c) *The remedy sought.* The Bill prays for an injunction or such other relief as may be appropriate. It is possible that either injunction, mandamus or prohibition might be employed as remedies if the present case were one of private litigation. If it be deemed that the District Court has no jurisdiction whatsoever because this is a suit against a State, prohibition would undoubtedly lie. If it be deemed, however, that while the District Court has jurisdiction because of the nominal appearance of the parties and the form of the suit, injunction would seem the more appropriate remedy. While we do not assume that the Supreme Court is primarily concerned with the division of common law remedies when operating in the broad realm of sovereign states, it should be pointed out that prohibition and mandamus are common law remedies which must rest upon common law doctrines. If the division between equity and law is to be maintained, this is properly a suit in

equity. It involves the consideration of the broadest sort of equitable principles. The doctrines of political policy, the wisdom of encouraging local government and administration, are not fields with which the common law is traditionally concerned. On the other hand, we see here, in the first place, a suit which is primarily based on a previous judgment in equity, namely, on Kansas v. Colorado. It was an equitable judgment, not cognizable or recognized by the law courts, and enforceable only in equity. Jurisdiction was even expressly reserved at the close. In the next place the rights of the individuals in both Kansas and Colorado are derivative in nature. They are beneficiaries, with indirect claims to the subject-matter litigated in *Kansas v. Colorado*. Furthermore, the relief sought here is not relief merely against the present litigation. It is relief against threatened similar litigation of the same character which will naturally and inevitably ensue if the United States District Court enters any injunctions or orders against the Colorado ditches. There are other ditches in Kansas which can and will sue. The relief sought is broader than anything contemplated under the old writs of prohibition or mandamus.

Equity has often been employed to protect the rights of a state under circumstances generally similar to this.

Georgia v. Brailsford, 2 Dallas, 402, 415;

Georgia v. Tennessee Copper Co., 206 U. S. 230.

This Court can mold its procedure and process to suit its needs.

Kentucky v. Dennison, 24 How. 66, 98.

(d) *Ancillary.* The present suit in its equitable character is essentially ancillary to the main litigation in

Kansas v. Colorado. In that decision jurisdiction was expressly reserved by the Supreme Court to consider the matter further when the proper circumstances arose. The present case amounts to a proceeding, supplementary or ancillary in nature, whereby the Supreme Court is asked to make effective its decree in the former case against a party whose privy, representative and grantor, namely, the State of Kansas, was directly named and involved. For all practical purposes it is a request that the Supreme Court extend the verbiage of the decree in the former case to cover a party bound thereby but who now repudiates the effect of that decree because not named therein. Such ancillary proceedings are the natural function and within the original jurisdiction of a court of equity.

Root v. Woolworth, 150 U. S. 401, 410;

Wilson v. Alexander, 276 Fed. 875 (1921);

Wabash Railroad v. Adelbert College, 208 U. S. 38;

Krippendorf v. Hyde, 110 U. S. 276, 280;

St. Louis & San Francisco R. R. Co. v. Byrnes, 24 Fed. (2d) 66 (1928);

Central Union Trust v. Anderson County, 268 U. S. 93;

Fletcher's Equity Pleading, Sec. 958 ff.

CONCLUSION.

The inevitable situation involved in the Bill of Complaint, the broad scope of the issues, and the question of the political and social consequences involved need no further elaboration. Our problem has been, as we have seen it, not to remind this Court of the legal and constitutional conceptions on which our case must rest, but to make vivid to it an unfamiliar situation in

the far West. Colorado has carried its irrigation development to a point which few American citizens have realized. A new field of social and economic problems has developed and, based on these considerations, new legal conceptions, new adminsitrative conditions, and a new and strange employment of science. Irrigation law is perhaps the most vivid example of a developing and shifting legal system available in America. To its evolution have been devoted funds, energies, and capacities which could only be enlisted by the stern requirements of a community in which water and the use of water is the controlling problem of human life. That picture this brief has attempted to draw. The consequences of the picture the Supreme Court is more competent to follow, more experienced to judge, than ourselves. We ask only that the citizens of Kansas should follow the proper remedy, assert their complaints through their State, submit themselves to the orderly administration of their own social units. She protests earnestly, and pleadingly against the destruction of her system, the waste of her water, and the repudiation of the long-fought litigation in *Kansas v. Colorado.*

Respectfully submitted,

WILLIAM L. BOATRIGHT,
Attorney General of Colorado.

RALPH L. CARR,
Assistant Attorney General of Colorado.

JAMES GRAFTON ROGERS,
HENRY A. DUBBS,
FRED A. SABIN,
A. WATSON MCHENDRIE,
PLATT ROGERS,
HENRY C. VIDAL,
of Counsel.

FILE COPY

Office Supreme Court, U. S.
FILED
JUL 3 1929
CHARLES ELMORE CROPLEY
CLERK

In the Supreme Court of the United States.

OCTOBER TERM, 1927

[redacted] 1065

No. 15, ORIGINAL

THE STATE OF COLORADO,

Complainant,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,

Defendants.

REPLY OF STATE OF COLORADO TO THAT PART OF "SEPARATE ANSWER OF THE STATE OF KANSAS" PRAYING AFFIRMATIVE RELIEF

ROBERT E. WINBOURN,
Attorney General of Colorado.

JAMES GRAFTON ROGERS,
HENRY A. DUBBS,
FRED A. SABIN,
A. WATSON MCHENDRIE,
HENRY C. VIDAL,
Of Counsel.

THE SMITH-BROOKS PRESS, DENVER

In the Supreme Court of the United States.

OCTOBER TERM, 1927

No. 15, ORIGINAL

THE STATE OF COLORADO,
Complainant,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,
Defendants.

REPLY OF STATE OF COLORADO TO THAT PART OF "SEPARATE ANSWER OF THE STATE OF KANSAS" PRAYING AFFIRMATIVE RELIEF

I

The State of Colorado, a State of the Union, by leave of Court files this, its Reply to that part of the "Separate Answer of the State of Kansas," namely, Paragraph Twenty-second thereof, which prays affirmative relief, and answering the same, respectfully sets forth:

(a) Complainant denies all the allegations of paragraph "a" except that it admits that the course of the Arkansas River across the State of Kansas is substantially as alleged, but if the distance measured along the river is

370 miles (instead of approximately 200 miles, as alleged by the State of Colorado in the Bill of Complaint herein, as compared to a course upon the main river of a distance of 300 miles within the State of Colorado), then upon a similar method of measurement along all the sinuosities of the thread of the stream, the course of the river in Colorado would vastly exceed 370 miles, and if only the chief tributaries in Colorado be included, the total course of the stream would exceed the course in Kansas on the same basis many times. Denies that the average annual rainfall is, for the first 190 miles along the course of the river in western Kansas, insufficient to raise crops without irrigation, but alleges that, for a distance of not to exceed 100 miles from the western boundary of Kansas, while the average annual rainfall (from 16 to 26 inches per annum) is sufficient to raise crops without irrigation, there are years in which irrigation is and has been beneficially employed on account of shortage in precipitation. Colorado denies that the soil in western Kansas would be characterized as "porous," but alleges that it is a reasonably impervious combination of fine sand and clay, through which water percolates at moderate speed, but the river bed itself in this western area is wide and sandy and even before settlement by man was often entirely dry, and the river was practically discontinuous except during spring and occasional summer floods. Colorado denies that any use or diversion of waters within the State of Colorado has in any respect or in any appreciable degree reduced the quantity of percolating water in the valley of the Arkansas River in Kansas or lowered the water table, but alleges that if the water table has been in any respect lowered or affected, such conditions existed prior to the date of the filing of the Bill of Complaint in the cause of *Kansas vs. Colorado* in the year 1901 and prior to the date as of which the issues and adjudication therein were made, and alleges that since said adjudication the quantity and flow of percolating waters in the State of Kansas, in the bed of

the Arkansas River, have been materially increased as a consequence of the employment of water for irrigation and other uses in Colorado.

(b) As to whether the State of Kansas owns the particular tracts alleged for use in connection with the Soldiers' Home and the Industrial Reformatory near the Arkansas River in Kansas, the State of Colorado is without knowledge, but admits that the State of Kansas may own properties within the valley of the Arkansas River, but alleges that if so, they are east of the area in which irrigation has been, now is, or can be beneficially employed, and in an area of plentiful water supply and that material use of river-water has never been necessary or attempted or even convenient upon or connected with such property, and alleges that there is not and never has been any depletion of flow in the Arkansas River through the acts of Colorado and its citizens which has affected or could have affected the said State property, its use, value or employment for agricultural or other purposes.

(c) Admits the allegations of paragraph "c", except that complainant denies that the acts of the State of Colorado and its citizens, or any use or diversion of water within the State of Colorado, has in any respect decreased or materially or deleteriously affected the population, municipal corporations, water supply, or revenue of the State of Kansas, and particularly denies that the same have been so affected since the adjudication in the said State of *Kansas vs. Colorado*, and alleges that while the revenues of the State of Kansas are relatively less in its western than its eastern counties, the said condition is true throughout all western counties and not only those traversed by the Arkansas River, and the condition is the result wholly of factors other than the flow of the river or any use of the river within either state.

(d) Admits the allegations of paragraph "d" which recite early irrigation developments in the valley of the

Arkansas River in western Kansas, but denies that the said irrigation development was, to any material extent, on a sound economic basis; alleges that irrigation has not been a permanent or continuous resource for agriculture within the State of Kansas at any time, and alleges that the development of agriculture under irrigation in Kansas reached its crest prior to 1895, but since the adjudication in the case of *Kansas vs. Colorado* irrigation in Kansas from the Arkansas River has been enlarged, and is on a more prosperous basis and irrigation is now at a better and more productive stage than at any time since 1900 and there is available a better supply of water therefor.

(e) Admits the construction and existence, prior to 1901, of the Frontier Ditch, the Alamo Ditch, the Ft. Aubrey Ditch, the Amazon Ditch, the South Side Ditch, the Great Eastern Ditch, the Finney County Ditch and the Garden City Ditch, and the South Side Ditch, but alleges that none of the other ditches or diversion systems or structures mentioned in said paragraph ever reached completion or actually operated or diverted water in any real or substantial extent. As to the dates as to which any or all said ditches were commenced plaintiff has no information but alleges that all were constructed prior to 1901, if at all. Alleges that there has never been, in any one year, to exceed the present acreage of land in the Arkansas basin in Kansas upon which water was applied, that there were not to exceed about 10,000 acres under irrigation at the time of the adjudication in *Kansas vs. Colorado*, within the State of Kansas, and that upon much of this, water has been applied only occasionally in seasons of low rainfall, and admits that as a consequence of the fact that river flow conditions are now better, irrigation is increasing, and the acreage under partial irrigation in Kansas may equal 70,000 acres or more.

(f) Denies all the allegations of paragraph "f" except that complainant admits that there was, prior to the year

1901, an increase in the quantity of water diverted and used from the Arkansas River in the State of Colorado, but denies that there has been any increase in the quantity of water used and diverted within the State of Colorado since the year 1901, but on the contrary alleges that the diversion and use of water in Colorado since said date has not increased in quantity or volume; alleges that the quantity and character of the supply of water in the Arkansas River at and east of the boundary line between Colorado and Kansas has been steadily improved since 1901, by reason of stabilization in the flow, return waters and percolating waters and other conditions brought about by the permanence and scientific character of irrigation and agriculture in Colorado, and the total quantity flowing into Kansas each year is increasing and exceeds the amount at any time required for beneficial purposes in Kansas.

(g) Denies all the allegations of paragraph "g" except that complainant admits that at all times since the beginning of irrigation in Colorado, the use and beneficial application of water in Colorado has been made with the permission of, to some extent with the aid of, and under the authority of the State of Colorado, but denies that, at any time, such use and diversion of water in Colorado has injured the State of Kansas, its citizens, residents or water users, or in any respect infringed the right of the State of Kansas, its citizens, residents or water users. Complainant denies that any citizen or resident of Kansas has any prior right, or any right by appropriation at all or any right to the use of water against the State of Colorado or any citizen, resident, inhabitant or corporation using, claiming or about to use or claim any water from the Arkansas River or its tributaries within the State of Colorado and denies that the irrigation enterprises now existing in Kansas are, by construction or priority in time or on any account or theory senior in claim to any use of water in Colorado.

(h) Admits the allegations respecting the general course of the suit in the Supreme Court of the United States known as *Kansas vs. Colorado*, admits the dates recited, but denies that the said proceeding was not a general adjudication of all the rights of the State of Kansas and its citizens, inhabitants and residents, as against all of the rights of the State of Colorado, its citizens, inhabitants and residents, and alleges that the contrary is the the case, and that said litigation had the effect and result heretofore pleaded and set forth by the State of Colorado in its original Bill of Complaint herein. Denies that the said Bill of Complaint in *Kansas vs. Colorado* was dismissed without prejudice, but alleges that the said cause was a final adjudication of the relative claims of the two states, and of all citizens, inhabitants, claimants, corporations, residents and other persons or individuals using water within the respective states, to the date and as of the date of the closing of testimony in the said adjudication, and alleges that no questions of law or fact remained undetermined in the said cause, except such as might arise from events subsequent to the closing of testimony in the said cause.

(i) Denies all the allegations of paragraph "i" and more especially denies that this pending case includes or can include any questions as to the rights of individuals in Colorado or Kansas, as such respectively, and denies that there are any such individual rights entitled to recognition, except by their respective sovereignties and within their own state, and alleges that there can be no issue in this cause except the relative rights of the two sovereignties, the State of Colorado and the State of Kansas, to the benefits of the waters of the Arkansas River, from and after the date of the closing of testimony in the case of *Kansas vs. Colorado*, to wit, on or about June 16, 1905, and then only to the extent that such questions are affected by events subsequent to the said date.

(j) Denies all the allegations in paragraph "j" and

particularly all those respecting increased use or diversions in the State of Colorado, and alleges on the contrary that the total effect of the acts of Colorado, its citizens, derivatives and residents, since the adjudication of *Kansas vs. Colorado*, has been to improve the quantity, flow and availability of water in the Arkansas River in the State of Kansas for all purposes and at all places whatsoever.

(k) Denies all the allegations of paragraph "k" except as hereinafter expressly admitted. Complainant admits the organization and existence of The Finney County Water Users' Association, but denies that it has or owns an appropriation of water to the extent of 250 cubic feet per second, or any appropriation whatsoever. Denies that its claims or use date from 1880, but admits that it has, since about 1885, operated with somewhat varying continuity, through itself or its predecessors in interest, an irrigation canal, capable of carrying a maximum of about 150 cubic feet of water per second, and that it has, since said date, irregularly and discontinuously, irrigated lands to the extent of about 10,000 acres. Admits that the two suits alleged were filed by said Finney County Water Users' Association and parties were named as defendants therein as stated; admits that the defendants in the first suit mentioned have, since long prior to the adjudication of *Kansas vs. Colorado*, been appropriators and users of water from the Arkansas River in Colorado, and that their use of water has continued practically the same since long prior to 1905. Alleges that of the defendants named in the second suit, few of said defendants are actual users or diverters of water in the State of Colorado, and alleges that the total consumptive use of said defendants named in the second case is comparatively small.

Admits that all persons taking water within the State of Colorado as a general rule divert and use the same with the aid, authority and permission of the State of Colorado,

but denies that there has been, since the adjudication in the case of *Kansas vs. Colorado*, any material increase whatsoever in the quantity of water used or diverted in the State of Colorado or other alteration in the diversion and use of Colorado which would diminish or deleteriously affect the State of Kansas or any user of water, inhabitant or resident thereof, but alleges upon the contrary that, since said adjudication, the supply of water in said river in Kansas, the quantity thereof, and the conditions thereof, have been steadily improved by the use of water in Colorado and by the climatic conditions, the rise in the water table, the increase of percolation and the general improvement of the water supply consequent thereon.

(l) Denies all the allegations of paragraph "l" except that complainant admits that the State of Colorado, its residents and citizens, will continue the diversion and use of water for irrigation in Colorado, but denies that the same will be in any way increased or will in any respect injure or damage the State of Kansas or any resident, citizen or inhabitant thereof, and denies that the State of Colorado or its citizens or inhabitants as a whole threaten to, or will, or will be permitted to so increase or alter the use of water in Colorado as to injury or damage the State of Kansas, or any citizen, resident or claimant therein.

(m) Denies the allegations of paragraph "m".

II.

AS A FURTHER REPLY TO SAID PRAYER FOR AFFIRMATIVE RELIEF, the State of Colorado sets forth as follows:

On the 20th day of May, 1901, the State of Kansas in its sovereign capacity, and upon behalf of and representing its citizens and inhabitants, and all persons and corporations claiming the right to use the waters of the Arkansas

River in the State of Kansas, either as riparian owners or appropriators thereof for domestic, irrigation, manufacturing or other beneficial uses, and also in all the capacities known to the law, filed its certain bill of complaint in the Supreme Court of the United States against the State of Colorado as defendant, and thereafter and on the 17th day of August, 1903, filed its amended bill of complaint in said proceedings against said State of Colorado, and against certain other appropriators of water in Colorado.

In the said original and amended bill of complaint the said State of Kansas alleged that the State of Colorado and others were depriving and threatening to deprive the said State of Kansas and its inhabitants (including the predecessors of The Finney County Water Users' Association), of all the water theretofore accustomed to flow in the Arkansas River; and, in its said bill of complaint and in the evidence offered in support thereof, said State of Kansas claimed that formerly, in Kansas, the waters of the Arkansas River furnished a wholesome and ample supply for domestic purposes, for the watering of stock, for power for operating mills and factories, and for saturating and subirrigating the bottom lands back to the uplands on either side of the river, so that crops thereon were not only bounteous, but practically certain, and that in the western portion of the valley of said river, in Kansas, these waters were formerly appropriated and used for surface irrigation to supplement the scanty rainfall in that region; and also that, after the lands in the Arkansas Valley, in Kansas, had been settled and raised to a high state of cultivation (all the bottom lands in the valley being alleged to be riparian lands and directly affected by the presence and flow of the river), and after parts of the flow of the river had been used for manufacturing and building purposes, and after the riparian lands had been largely and extensively irrigated in the valley of the river in the western portion of Kansas, by

diversions made in Kansas, and after portions of the land so irrigated had been sold and conveyed, the State of Colorado, its citizens, inhabitants and others, began systematically appropriating and diverting the waters of the Arkansas River in the State of Colorado between Canon City and the Kansas state line, for the purpose of irrigating dry, barren, arid, non-riparian and non-saturated lands lying on either side of the river and often many miles therefrom; and that, by the year 1891, all the natural and normal waters and a large portion of the flood waters of said river were so appropriated and diverted and actually applied to these dry, barren, arid, non-riparian and non-saturated lands in the State of Colorado (said diversions increasing from year to year, as their means of diversion became more complete and perfect), that the average flow of the river became greatly and permanently diminished, and the normal flow of the river, exclusive of floods, wholly and permanently destroyed, the navigability of the river ruined, the power for manufacturing purposes greatly diminished, and the surface of the underflow lowered, and the water for the irrigation ditches in the western portion of Kansas entirely cut off. Said State of Kansas also alleged in said bill that the loss sustained by said state and its citizens had been great and incalculable; that the cheap water power had been destroyed, the productivity of the bottom lands diminished, and the irrigating ditches left dry and the lands uncultivated.

The said State of Colorado and others (being water users therein made parties defendant) by their several answers, and by the evidence offered in support thereof, claimed that the lands along said river in the State of Colorado were naturally arid and unproductive, and incapable of sustaining human life except by the diversion and application by irrigation of the waters of said river and its tributaries, and that the said State of Colorado, by its Constitution and laws, and the decisions of its courts, had declared that the

waters of said river and of all other streams within the State of Colorado were the property of the state, subject to appropriation by the citizens and inhabitants thereof for irrigation and other beneficial purposes, and that said state claimed the right to divert, and to continue to divert, the waters of said river to the extent necessary in the irrigation of the lands lying along said river in priority and paramount and superior to any right of the State of Kansas, or the citizens or inhabitants thereof.

On the 16th day of May, 1904, one Granville A. Richardson was duly appointed by said Supreme Court of the United States a commissioner to take and return the testimony in said cause, and thereafter said commissioner proceeded to take the testimony of the said State of Kansas, and of certain of the citizens and inhabitants thereof claiming rights to the use of the waters of the Arkansas River in priority to the State of Colorado; and there was included in said testimony evidence of use of water by and the appropriations claimed to have been made by the predecessors in interest in the ditch and structures now owned by the said The Finney Association and all other ditches mentioned in the "Separate Answer" of the State of Kansas herein, and of the deprivation of water for said ditches caused by the appropriations of the State of Colorado and others. And upon behalf of said State of Colorado and the citizens and inhabitants thereof, evidence was offered of the appropriations of the waters of said river made by the State of Colorado and others and of the amount of land irrigated thereby, and the influence of the use of said water as a part of the resources of the state, in the settlement, growth and development of the lands along said river in Colorado.

The testimony so offered by the respective parties was closed on June 16, 1905, and included the facts and conditions to that date and was duly returned to said Supreme Court by said commissioner. Thereafter and on the 13th

day of May, 1907, the said cause was determined by said Supreme Court, and it was then and there declared and held by said court that equality of right and equity between said State of Kansas and said State of Colorado forbade any interference with the then existing diversion and use of water for purposes of irrigation in Colorado, and that, to the extent that the waters of the Arkansas River had been diverted for beneficial purposes and used in the irrigation and reclamation of its arid lands, Colorado was within the reasonable exercise of its sovereignty, and that said State of Kansas, in its sovereign capacity and as representing its citizens and inhabitants, had not made out a case entitling it to a decree; and thereupon the said bill of complaint as against the said State of Colorado and others was dismissed, but without prejudice to the right of the State of Kansas to institute new proceedings when it should appear that, through a material increase in the depletion of the waters of said river by Colorado, its corporations or citizens, the substantial interests of Kansas were being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river.

The said finding and judgment of the said Supreme Court was intended to be, and was and is, as of the date of the closing of testimony therein, to wit, June, 1905, a final determination of the rights of the States of Kansas and Colorado, respectively, in and to the waters of the Arkansas River, and of the extent to which, within the respective territory of said states, the citizens and inhabitants thereof, respectively, may use the waters of said river for domestic, irrigation, manufacturing or other purposes; and was intended to be, and was and is, a final judgment and decree that the rights of the State of Colorado and others, as appropriators of the water of said river in Colorado, were and are superior, prior and paramount, and in effect the State of Colorado, its citizens, inhabitants and all diverters and

users of water for beneficial or useful purposes from the Arkansas River within the State of Colorado were thereby quieted in the use and enjoyment thereof against the claims made by the State of Kansas, or any citizen, resident or inhabitant thereof.

The State of Colorado further alleges that, although neither The Finney County Water Users' Association nor its predecessors in title or interest were parties by name to the proceedings instituted in the Supreme Court of the United States by the State of Kansas against the State of Colorado and others, nevertheless they were directly interested in the subject matter of the said proceedings, and well knew, at the time the said bill of complaint of the State of Kansas was filed, that, in and by the said bill of complaint, the said State of Kansas declared that it was acting in their behalf and as their representative, and was asserting as against the State of Colorado the same right now claimed by the said corporate defendant, The Finney County Association, in this suit or its attempted suits in the lower Federal Courts, and then and there, and at all times subsequent thereto, the said predecessors in title and in interest of The Finney Association consented to the said claim of representation by the State of Kansas, and acquiesced in, approved and adopted said proceeding as having been instituted and conducted for the common interest of the various persons and corporations claiming rights in and to the waters of the Arkansas River in the State of Kansas, including the predecessors in title and interest of The Finney Association, and including the rights now claimed by said Association. At all times during the progress of the said litigation between the State of Kansas and the State of Colorado, the said predecessors in title and in interest of the said Association stood by and aided the State of Kansas in the prosecution of the said action, hoping and believing that the said State of Kansas would be successful in said proceeding, and that thereby the waters of the Arkansas

River now claimed by the said Association would be secured for it in said proceeding, and awaited the outcome of the said action with the intent and purpose of claiming the benefit thereof as against the State of Colorado.

The State of Colorado further alleges that the flow of water to which the State of Kansas now asserts a right is the same flow of water, and not other or greater, than that decreed by the Supreme Court of the United States in the action aforesaid, to belong to the State of Colorado, and to be lawfully subject to distribution in the said State of Colorado, according to its laws, to the State of Colorado and others, and that the State of Kansas is now asserting and complaining of matters, interests and events all of which were asserted and complained of by it in said original proceeding and then and there were considered adjudicated and were determined against the State of Kansas and its citizens, residents and inhabitants.

Wherefore, the State of Colorado alleges that the claims of the State of Kansas, its citizens, residents and inhabitants and all users and diverters of water therein (including The Finney County Association) as against the State of Colorado and its citizens and inhabitants to the use of the waters of the Arkansas River have been fully and were finally and completely adjudicated and determined by said judgment and decree of the Supreme Court of the United States, and the same is a bar to the further prosecution of this action, except that this Honorable Court, if the aggregate consumptive use of water in Colorado has increased since the year 1965 without corresponding benefits to the State of Kansas, may consider whether such increase has yet carried the use in Colorado beyond the limitations equitably resting upon the State of Colorado as a sovereign state in the United States, in view of the respective needs and resources of the states as a whole and the benefits of this and other resources available to either state.

III

AS A FURTHER REPLY TO SAID PRAYER FOR AFFIRMATIVE RELIEF, the State of Colorado alleges:

The persons named in the "Separate Answer of the State of Kansas" herein as being defendants in the individual suits brought by The Finney County Water Users' Association altogether total less than one hundred and fifty actual users of water for beneficial purposes from the Arkansas River and its tributaries within the State of Colorado, and represent less than one-fourth of the users in the State of Colorado in quantity of water diverted from said river. The list contains many names which represent no use of or claim upon the river or its tributaries. There are, in the State of Colorado, more than four thousand decreed, duly adjudicated and recorded claims and many more than four thousand individual persons and corporations diverting water from the Arkansas River and its tributaries under lawful authority of the State of Colorado. Colorado is ready and willing to supply a list of the names of the said individuals appearing upon its official records, but because of the voluminous character of such list, does not at this time file the same as part of this pleading, or encumber the pleadings and records of this Court with the same. Colorado alleges that none of the said persons or corporations are necessary or proper parties to this cause; that if any should be made parties, all should be made parties, but respectfully represents, that, as all of the said rights are derivative from and would be bound by any adjudication or determination against the State of Colorado, it would unnecessarily encumber these proceedings to make any of them parties hereto, and that none can be selected on any partial basis, without inconvenience and improper emphasis in this cause, or in any manner that is just or lawful.

Wherefore, the State of Colorado prays that none of the additional parties suggested by the State of Kansas should be made parties defendant herein.

IV

AS A FURTHER REPLY TO SAID PRAYER FOR AFFIRMATIVE RELIEF, the State of Colorado sets forth as follows:

(a) On the first day of August, 1876, the State of Colorado was admitted into the Union, and thereby became and now is a sovereign state, entitled as such to possess and exercise within the boundaries of its own territory the full right of sovereignty in respect to the control and utilization of all of those internal natural resources upon which the existence, growth and prosperity of the state, and, in particular, the means of subsistence of its citizens and inhabitants, depend. Throughout the limits of said state the rainfall is so slight that the lands cannot be tilled and made to produce crops, as may be done in the State of Kansas and in the other states lying to the east of Colorado; and long prior to the admission of said State of Colorado, and during the existence of the Territory of Colorado, it was well known that, to make any of said lands fruitful and capable of human habitation, it was necessary to divert the waters of the natural streams and apply the same to the lands bordering said streams, and thus produce by artificial methods the conditions favorable to plant life which in other states were produced by rainfall. And it was also well known that the area thus capable of being made fertile and productive would, because of scarcity of water, be a very small proportion of the entire area of said state.

The members of the convention which framed the Constitution upon and by reference to which the State of Colorado was created, well knowing the climatic and physical conditions which distinguished the lands of said state from those of most of her sister-states, and the necessity of using the entire volume of the waters of the natural streams arising and flowing through the territory of said state, and in-

tending, as of right they were entitled to do, to declare the sovereign right of the said State of Colorado in said natural streams and the waters thereof, and the uses to which in the settlement and upbuilding of said state said waters should be devoted, by said instrument declared:

> "The water of every natural stream, not heretofore appropriated, within the State of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided.
>
> The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied. Priority of appropriation shall give the better right as between those using the water for the same purpose; but when the waters of any natural stream are not sufficient for the service of all those desiring the use of the same, those using the water for domestic purposes shall have the preference over those claiming for any other purpose, and those using the water for agricultural purposes shall have preference over those using the same for manufacturing purposes."

By the proclamation of the President of the United States made on the first day of August, 1876, it was made known to all the world that the said State of Colorado was admitted into the Union upon the declarations contained in said Constitution, as the fundamental and underlying principles and policies of said state, which, upon behalf of the several states of the Union, were accepted as consistent with the natural, climatic, physical and economic conditions presented within the boundaries of said state; and said Constitution thereupon became notice to all the world that the said State of Colorado in her sovereign capacity claimed and appropriated all the water of the natural streams of said state as against all sister states and sovereignties, and the

citizens and inhabitants thereof, and devoted said waters to those uses which would conserve and advance the general welfare of said State of Colorado, its citizens and inhabitants.

Upon the admission of said State of Colorado, the said State of Kansas and the citizens and inhabitants thereof, well knew, and at all times since and until the bringing of this action have known, that the said State of Colorado claimed and exercised full and exclusive administration and control of all the waters of the natural streams while flowing through said state, and that, as to those streams flowing into the State of Kansas, the said State of Colorado, its citizens and inhabitants, claimed and exercised the paramount and exclusive right thereto, and that the said State of Colorado by its laws and the decisions of its courts provided for the regulation, control and distribution of the waters of said natural streams in the reclamation and irrigation of its lands and other beneficial uses.

Prior to the admission of said State of Colorado it was well known that the climatic, physical and economic conditions presented within the limits of the State of Kansas were entirely different from those presented within the State of Colorado (there being at all times throughout said State of Kansas sufficient rainfall for the growing of crops, except that in the extreme western portion of said state crops may suffer during occasional years of drought), and, in view of and with reference to such conditions, the Constitution, laws and decisions of the courts of the State of Kansas assert no public or common right in the waters of the natural streams of said state, but affirm the right of the riparian owners to the use of said waters, as said right prevails at common law where the irrigation of lands is not a fundamental necessity; and, by the decisions of its court of last resort construing the laws of said state in respect to the use of said waters, it denies the application to said state of the principles and

doctrines established in Colorado, as they are hereinbefore set forth.

At all times since the adoption of the Constitution of Colorado the said state, by its laws and judicial decisions, and by the action of its executive departments, has, because of its relatively paramount necessities, claimed and exercised the right to the use of all the waters of its natural streams adversely and to the exclusion of the several states into which said streams may flow, and to the exclusion of all persons claiming rights to water beyond the limits of said State of Colorado, and has been reluctant to recognize any appropriations or claims to water beyond said State of Colorado, or to concede the justice or sound public policy, state or national, of recognizing claimants of said natural streams in other states, where necessity was not so pressing. At the time of the appropriations made by the State of Colorado, the laws and policy of the said states were and have since been as above set forth, and the appropriations of the State of Colorado were made in the belief that the doctrines and principles of the State of Colorado in respect to the public ownership of the water of the natural streams within the state, and of the common right to appropriate and use the same in the irrigation of arid land, with the condition that in times of scarcity, priority of appropriation should give the better right, were local to the State of Colorado and did not extend to the State of Kansas, nor apply to any persons claiming or using water in said state, and that the said State of Kansas did not claim or intend that any riparian owners or users of water in said state should be entitled to assert or maintain any right to the use of said waters prior or adverse to the use by the State of Colorado of said waters while flowing in the State of Colorado. And the diversions of the Arkansas River in said State of Kansas were made in the belief and with the understanding that, subject only to the exercise of the right of eminent domain by the State of Kansas, the primary and exclusive right to

the use of the waters of said river within the State of Kansas belonged to the owners of lands riparian to said river, and that uses of the waters of said river within said state, whether by riparian owners or others, were subject to the paramount and exclusive right of the State of Colorado, its citizens and inhabitants, to use the waters of said river while flowing through said State of Colorado; and all persons using the waters of said river in Kansas have acquiesced in and adopted said view, and their action and the events of history and the policy of Kansas have all encouraged the State of Colorado in the belief that it was entitled to the paramount and exclusive right to the use of said waters as herein alleged. . . .

(b) As contrasted with the policy and attitude of the State of Colorado arising out of its necessities, its arid conditions and the fact that it faces the limitation of water supply within its borders as the dominating and controlling restriction upon the continued development of civilization within its borders, the attitude and policy of the State of Kansas exhibits a relative failure to rely or depend upon water supply from streams arising outside its boundaries and a recognition of the fact that the flow of the Arkansas River is and has been a relatively negligible factor in its economic prosperity, its growth and its civilization. Not only has the State of Kansas, as heretofore alleged, omitted from its Constitution, its statutes and the decisions of its tribunals any considerable emphasis upon special laws, institutions or devices for the employment of the waters of its flowing streams, but the history of its laws and agricultural development shows a continued lack of interest therein or reliance and dependence thereon. Its irrigation enterprises have seldom lived to maturity on account of lack of any prime reliance thereon for agricultural activities. Its farmers have failed to support the ditches and diversion enterprises with any consistency; they have all been subject to frequent financial

difficulties, re-organizations and other economic exigencies indicative of lack of interest therein and practically all its irrigation enterprises have at times been abandoned or reduced in operation during periods of slightly additional rainfall. The only subsisting enterprises of any importance designed for the diversion of stream flow from the Arkansas River in Kansas consist of a group of ditches, principally in Finney County, Kansas. This group consists of five ditches, known as The Amazon Canal, The South Side Ditch, The Great Eastern Canal, The Farmers' (sometimes called the Kansas or Kansas Farmers') Ditch and the Garden City Ditch. East of this group the rainfall is so considerable that irrigation is not economically practicable or desirable and while one or two enterprises were launched in the boom period between 1875 and 1895, no irrigation enterprises worthy of mention have survived during the last forty years. West of this group, through a space of about sixty miles between the Kansas-Colorado boundary and the Garden City section, the river flows through a stretch of land ill adapted to profitable agriculture and always thinly populated. From the earliest times the river had practically no surface flow during this stretch, the normal flow being absorbed in the sand and even considerable floods being dissipated and lost. One or two small ditches of comparatively minor dimensions were constructed in this stretch, mostly near the Colorado line, in the boom period above recited and one or two, after various years of abandonment and reconstruction, still survive. They have been recently revived by the increase in continuous flow brought about by the return waters now rapidly developing from long continued irrigation within the boundaries of Colorado. The Garden City group already mentioned, however, represents substantially the whole of the irrigation development within the State of Kansas which has survived the exigencies of lack of public support. The conduct and management of this group of ditches shows a failure to rely upon the principles and usages of irrigation in the

western states, an abandonment of any claims based upon such usages and doctrines and a course of conduct which reveals the comparative lack of need for irrigation by stream flow in Kansas, an acceptance of conditions arising therefrom and a failure to assert or rely upon the flow of water in the Arkansas River from the State of Colorado.

The Finney County Water Users' Association is the only considerable user or diverter of water from the Arkansas River in Kansas now asserting any complaints against the citizens or inhabitants of Colorado on account of use of the river in Colorado. No other user or claimant joins it in any complaint and neither it nor any other substantial user is in an equitable position to complain.

Whatever right the said defendant, The Finney County Water Users' Association, may have to the waters of the Arkansas River in the State of Kansas is founded upon and arises out of a compliance with the laws of Kansas, and the decisions of its courts in respect thereto. By the laws of Kansas and the decisions of its courts, the owners of lands along the Arkansas River in said state at all times since the creation of said state have had, and now have, the primary right to the flow of the waters thereof, and to the use thereof; and no right to the use of said water for irrigation or other purposes can be acquired by persons or corporations other than riparian owners, except by the grant of the riparian owners or the condemnation of such waters under the power of eminent domain.

By the statutes of Kansas (appearing as chapter 42 of the Revised Statutes of Kansas of 1923), corporations desiring to procure water for irrigation may condemn the right to take water from any stream in said state (same sec. 42-109; also *Clark vs. Allaman*, 71 Kansas 206) and proceedings for that purpose are authorized to be commenced in the District Court of the county in which said water is to be diverted;

and notice is required to be published in said county that all persons making claims for damages by reason of such diversion are required to appear, and thereupon, upon the ascertainment of the damages suffered and the payment of the same, the said corporation is entitled to divert said water.

By the statutes of Kansas appearing as section 42-3, 109, of the Revised Statutes of 1923, exclusive jurisdiction is conferred on the several District Courts of said state to ascertain and settle the several rights and priorities of persons interested either as carriers or as consumers of the water at any time appropriated, and said courts are authorized to appoint a bailiff to divide the water from any source of supply according to the rights and priorities of the ditches entitled to the same, and conformably to the order of the court.

Neither the said Finney Association nor its predecessors have ever acquired, by grant, purchase, condemnation or otherwise, any right to divert the waters of the Arkansas River into or through the Farmers Ditch (being the ditch of said Association) to the extent claimed, or to any extent whatever or for that or any other ditch.

On the 30th day of October, 1909, The Finney County Water Users' Association, claiming to be the owners of a certain ditch known as the "Farmers Ditch" (also called the "Kansas Farmers' Ditch" and "Kansas Ditch"), taking water from the Arkansas River at a point near the eastern boundary line of the County of Kearney in the State of Kansas, and acting in pursuance of said section 42-3, 109 of the Revised Statutes of 1923 hereinbefore referred to, commenced proceedings in the District Court of the County of Kearney to have ascertained and determined, in accordance with the laws of Kansas, the rights of all ditches and canals diverting water from the Arkansas River in Kansas; and by its complaint it prayed that all of the defendants

disclose and establish the nature of their claims to the waters of said river, and the owners of all the ditches in Kansas claiming and diverting the waters of said river were made parties thereto and were served with process.

In said proceeding, The United States Irrigation Company, a corporation incorporated under the laws of Kansas, and the then owner of the said Great Eastern Canal and the said Southside Ditch, was made a party defendant, and made answer to the said bill of complaint. Thereafter, another corporation, successor to the last named, the United States Irrigating Company, was incorporated under the laws of Wyoming, and become a party defendant in said proceeding, and made answer to the complaint, asserting ownership of said two ditches, in and by which it made no claim to the waters of said Arkansas River for said Great Eastern Canal or Southside Ditch, either by appropriation, purchase, grant, condemnation, or by any right other than by the alleged use of the waters of said river for more than fifteen years prior to the bringing of said action, during which time it was alleged that the said The United States Irrigating Company and its several grantors had used the waters of said river to the extent of 300 cubic feet per second through the said Great Eastern Canal, and to the extent of 180 cubic feet per second through the said Southside Ditch, adverse to any claim of right by the plaintiff in said proceeding; and it was further alleged that any pretended appropriation by means of the Farmers Ditch claimed by the Finney Association in said action had been abandoned.

The Finney County Water Users' Association, replying to the answer of the said The United States Irrigating Company, denied that The United States Irrigating Company, or its predecessors or grantors, had used either of the said ditches continuously for fifteen years, or that any diversion of the waters of said river adverse to the said Finney County

Water Users' Association had been made until less than two years prior to the bringing of said action; and further alleged that the canals and ditches through which the said The United States Irrigating Company claimed the right to divert water had been wholly abandoned and allowed to remain in disuse from a time soon after their construction until less than ten years prior to the bringing of said action, and that all right of said Great Eastern Canal and said Southside Ditch had been wholly lost and abandoned.

Thereafter, upon the petition of the said The United States Irrigating Company, the said company claiming to be a citizen of Wyoming, the proceedings were removed to the United States Circuit Court for the Western District of Kansas, in which court the said Finney County Water Users' Association thereupon filed its motion to remand said proceedings to the District Court of Kearney County. While said motion was pending, and for the purpose of preventing the ascertainment and settlement of the rights of the said several parties, and in particular the rights of the said The Finney Association, in accordance with the statutes of said State of Kansas in such case provided, and to avoid proof being made supporting the allegation of the said parties that the Farmers Ditch and also the Great Eastern Canal and Southside Ditch and other ditches had been abandoned and were not entitled to divert any of the waters of the Arkansas River, the several parties to said proceeding—to wit, The Finney County Water Users' Association (the owner of the Kansas or Farmers' Ditch), the Garden City Irrigation Association (the owners of the Garden City Ditch), the Kearney County Farmers' Irrigation Association (the owner of the Amazon Canal), and The United States Irrigating Company (the owner of the Great Eastern Canal and the Southside Ditch)—on May 16, 1911, entered into a certain stipulation for an interlocutory decree, and caused an interlocutory decree to be entered in said proceed-

ings. The said parties so stipulating were and are the only large users of waters in Kansas from the Arkansas River and their use comprises substantially the whole use of or demand for water in Kansas from said river. The stipulation so made was in substance as follows:

The appearance of the said Finney County Water Users' Association for the purpose of said stipulation and decree was declared to be special, and without prejudice to its right to renew its motion to remand said proceedings after the expiration of the time limited by said interlocutory decree; and it was thereupon also decreed as follows:

That said interlocutory decree should remain in force and effect only until that certain controversy pending in the United States Circuit Court for the District of Colorado entitled *The United States Irrigating Company vs. The Graham Ditch Company, et al.* (which is described in paragraph "Twelfth (a)" of the Bill of Complaint of the State of Colorado in this pending cause), should have been disposed of and adjudicated, and until such time, within five years thereafter, as The Finney County Water Users' Association should file with the clerk of said court its writing by which it should elect either that the said interlocutory decree should become permanent as between the parties specifically named, or should elect that said temporary decree should be terminated at the time of filing said written election, and that, if said Finney County Water Users' Association should elect that the provisions of said interlocutory decree should terminate, then that the said Association might immediately, at the time of filing its said election, call up for hearing and disposition its motions to remand the said cause of *The Finney County Water Users' Association against The United States Irrigating Company, et al.*, with the same force and effect as though the motions then on file in said court were presented prior to the entry

of the appearance of the said Finney County Water Users' Association for the purpose of said interlocutory decree; and that no acts or things done by any of the parties, during the pendency of said interlocutory decree, should in any wise prejudice the right of said Finney County Water Users' Association to press said motions to remand; and that, during the period prior to the time when the suit of *The United States Irrigating Company vs. The Graham Ditch Company* should be finally adjudicated, the water of said river, stated as being 1,050 feet, should, without any reference to any questions of priority of right between the parties, be distributed and rotated between the parties in the following proportions:

To the Amazon Canal	16/84
To the Southside Ditch	16/84
To the Great Eastern Canal	16/84
To the Farmers' Ditch	21/84
To the Garden City Ditch	8/84

and that, after the date of the final adjudication of said suit of *The United States Irrigating Company vs. The Graham Ditch Company*, subject, however, to the election of The Finney County Water Users' Association to terminate said interlocutory decree, the proportion of water distributed to each of said ditches should be as follows:

To the Amazon Canal	4/21
To the Southside Ditch	4/21
To the Great Eastern Canal	6/21
To the Farmers' Ditch	5/21
To the Garden City Ditch	2/21

and that, prior to the adjudication of said last-mentioned suit, the rotation of said water in acre-feet should be as follows:

To the Amazon Canal.....3,000
To the Southside Ditch.....3,000
To the Great Eastern Canal.....4,312½
(the latter amount to be used by The United States Irrigating Company either for storage in its reservoirs or for direct irrigation)
To the Farmers' Ditch.....3,937½
To the Garden City Ditch.....1,500.

and that, after the final adjudication of said last-mentioned suit, subject to the election of the said Finney County Water Users' Association to terminate said interlocutory decree, the distribution of water by rotation should be (in acre-feet):

The Amazon Ditch.....3,000
The Southside Ditch.....3,000
The Great Eastern Ditch.....4,500
(to be used by The United States Irrigating Company either for storage in its reservoirs or for direct irrigation)
The Farmers' Ditch.....3,750
The Garden City Ditch.....1,500

It was also stated in said decree that the provisions of said decree should extend to and embrace all the water of the Arkansas River to which any of the parties thereto were or might thereafter become entitled, and it was provided that nothing in said interlocutory decree should in any wise prejudice the rights of any of said parties thereto at any time in any litigation now pending between any of the parties concerning the subject-matter of said decree, should such litigation ensue upon the election of The Finney County Water Users' Association to terminate said interlocutory decree; and it was provided that the jurisdiction of the officer appointed by the court should extend over the subject-matter of said interlocutory decree and the enforcement thereof. The said interlocutory decree remained in full force and effect until it became permanent as hereinafter set forth.

Said stipulation, and said interlocutory decree entered in pursuance thereof, were collusively and fraudulently made and entered by the parties thereto for the purpose of preventing the ascertainment and determination by said District Court of the State of Kansas, as the court having exclusive jurisdiction to ascertain and determine the same, of the rights and priorities of the respective parties to said stipulation and decree to the water of said Arkansas River. Those rights and priorities, as said parties well knew, cannot effectively be ascertained and determined by any tribunal acting outside of the jurisdiction of said State of Kansas, and the details are known only in the immediate neighborhood and are inaccessible to the State of Colorado or any non-resident of Kansas. The parties thereby mutually prevented proof being made in the proper proceedings in said State of Kansas of the truth of the respective allegations of each other, that neither the said Farmers' Ditch and other ditches had ever obtained any rights or priorities to the water from said river, and that whatever rights and priorities had been obtained had been long previous thereto abandoned. The stipulation and arrangement had also the further inequitable and iniquitous purpose of suppressing by the combination and confederation of the parties thereto the facts concerning the alleged appropriation by the said Farmers' Ditch, and by their concerted silence to prevent The State of Colorado, its citizens and residents, from obtaining within the jurisdiction of Kansas the facts concerning the alleged appropriations of said Farmers' Ditch and the other ditches which are the principal users of waters in Kansas from the Arkansas River, and the abandonment thereof. All of which acts and doings were contrary to equity and good conscience, in fraud of the laws of the State of Kansas and in violation of the rules and principles of law entitling a citizen to relief or advantage of relief in any court.

Thereafter in the said case, then pending in the United States District Court for the District of Kansas, First Divi-

sion, the aforesaid motion to remand was by order sustained, but the complainant thereafter withdrew the said motion and consented to a revocation of said order, and a final and permanent decree was thereupon entered on or about April 8, 1912, by consent of the parties thereto, including The Finney County Water Users' Association; and in and by the said decree it was finally adjudged and decreed that the water of the said Arkansas River in Kansas as aforesaid shall be distributed and rotated as follows, without priority between the parties:

To the Amazon Ditch sixteen eighty-fourths (16/84);

To the South Side Ditch sixteen eighty-fourths (16/84);

To the Great Eastern Canal, twenty-three eighty-fourths (23/84);

To the Farmers' Ditch twenty-one eighty-fourths (21/84);

To the Garden City Ditch eight eighty-fourths (8/84); and the rotation of water in acre-feet was decreed to be in the amount as follows:

The Amazon Ditch three thousand (3,000) acre-feet;

The South Side Ditch three thousand (3,000) acre-feet;

The Great Eastern Ditch four thousand three hundred twelve and one-half (4,312½) acre-feet, to be used by The United States Irrigating Company either for storage in its reservoir or for direct irrigating;

The Farmers' Ditch, three thousand nine hundred thirty-seven and five-tenths (3,937.5 acre-feet);

The Garden City Ditch, one thousand five hundred (1,500) acre-feet.

It was also permanently adjudged and decreed in and by the said decree that the provisions of the decree shall extend to and embrace all of the waters of the Arkansas River to

which any of the parties to the said decree were then or might thereafter become entitled.

The said decree has been since its entry and is now in full force and effect, and the Finney Association has been and is now receiving water for its canal thereunder, and not by virtue of any priority claimed by it or adjudicated in its favor or in favor of its Farmers' Ditch and the other parties thereto have likewise abandoned and given up any claims to priority of use or any appropriation claims, doctrines or theories.

At the time of the entry of the interlocutory decree and also of the final decree aforementioned there was pending in the United States District Court for the District of Colorado on the equity side the suit of The United States Irrigating Company against certain defendants, who were considerable water right owners on the Arkansas River in Colorado (being the suit mentioned in paragraph twelve (a) of the plaintiff's complaint). The said suit was begun August 10, 1910. Thereafter, in the year 1916, the defendants and the plaintiff in the said suit of The United States Irrigating Company adjusted their controversies therein, as the State of Colorado is informed, by the device of a money payment by the private interests in Colorado to the private interests in Kansas, whereby the Kansas ditches agreed to abandon their claims against the defendants in Colorado or claims of water from them, and to dismiss said suit. The said suit was dismissed finally, in the month of May, 1916, with prejudice. The said adjustment was participated in by the defendants (who were individual corporations in Colorado) and by the plaintiff therein and also by the owners of the Amazon Canal, the South Side Ditch, the Great Eastern Ditch and the Garden City Ditch, all referred to in the final decree hereinbefore mentioned as having been entered in the United States District Court for the District of Kansas. The Finney Asso-

ciation did not affirmatively adopt and approve said dismissal as did all the other parties to said stipulations and decrees in the United States Court for Kansas but it has at all times accepted the benefits of said stipulations and decrees, adopted the same and received its water thereunder, thereby in effect and equity accepting the said dismissal and the consequences thereof.

By the aforementioned decree all said principal users of water in Kansas abandoned any priority which they or either may have had in and to the waters of the Arkansas River in the State of Kansas; and any and all right or claim which prior thereto each or all might have lawfully asserted by virtue of its priorities theretofore claimed, was and has since been waived; and all of their right to water has by virtue of the premises been divided with the other parties to the aforementioned Kansas decree, as therein recited, the said parties being the parties with whom the said Colorado defendants have made their adjustment, and by the foregoing facts recited The Finney Association and the others named have transferred and disposed of the alleged rights, if any they ever had, and are estopped from asserting any claims based upon priority, or earlier date, or the relative date of first user or upon seniority of construction, claim or enterprise and are estopped to assert any claims against the State of Colorado or the users and consumers of the waters of the Arkansas River in the State of Colorado. By said proceedings and decrees the irrigators of Kansas recognized and accepted the limitations on the flow of the Arkansas River then and now existing and showed they were content to abide thereby. The Kansas ditches and irrigation enterprises named above and which participated in said stipulations, decrees and said adjustment and abandonments of their alleged claims are not only the principal users of irrigation water from the Arkansas River in Kansas but are the only large users therein and represent

substantially the whole of the use and demand for water in Kansas. The Colorado ditches sued in said action, and who purchased immunity as alleged above and who purchased dismissal of said suit represent the largest users of water from the Arkansas River in Colorado and include the large enterprises most immediately and directly affected by any claims to water by the State of Kansas so far as quantity of use and geographical location is involved. Neither the State of Kansas nor the State of Colorado was a party to any of said proceedings or participated therein or in said money payment or dismissal.

(c) The effort and endeavor to make full use of the respective physical, climatic and geographical resources in the States of Kansas and Colorado are in great contrast. The rainfall in the Arkansas Valley in Colorado varies from about eleven inches per annum to nearly sixteen inches per annum precipitation, the latter figure being reached only for a short distance at the eastern margin of the state. The annual precipitation in the State of Kansas varies from a minimum of sixteen or seventeen inches to an annual amount far in excess of the normal requirement for the growth of the usual crops in the Mississippi Valley. Even in the extreme western counties of Kansas, where soils are adaptable at all to agriculture, the rainfall is sufficient in frequent years to raise crops without recourse to the expensive devices of irrigation.

The lands in Colorado irrigated by ditches and reservoirs are wholly dependent for their cultivation on the waters of the Arkansas River, withdrawn for that purpose; and but for such waters would be arid and sterile. There is no other source of water supply for said lands. The lands under the ditches in Kansas are situated in a more humid climate and require less water for their economical irrigation than those of Colorado; and, in addition, there are

sources of supply available for the irrigation of its said lands, and which are not available in Colorado:

The said lands in Kansas are underlaid with ground waters which are available for irrigation through the construction of wells, and the land can readily be supplied with water thereby, if and when the said lands may lack water from rainfall. In addition, the waters of the underflow of the Arkansas River in Kansas at and above the headgates would furnish a large source of supply for the ditches and lands thereunder. Of neither of these sources, however, have the citizens of Kansas availed themselves to any adequate degree.

The appropriators of water from the Arkansas River in Colorado and their predecessors have spent many millions of dollars in developing and conserving their only source of supply, and in connection therewith have constructed large and expensive reservoirs which conserve the flood waters which would otherwise go to waste. By their care and expenditures, as aforesaid, and by economy in the use of the waters, they have brought their properties to their present state and condition of value. The State of Kansas, however, has done little to avail itself of the natural resources which at all times have existed and now exist in the State of Kansas, and which are and have been available for the irrigation of lands; otherwise the said lands would at no time lack water, if they at any time do lack water. The residents of the Arkansas Valley in Kansas have made no reasonable attempt to use the underflow of the river available at their headgates. They have made no reasonable attempt to conserve the underground waters obtainable by wells. They have stood by without protest and have permitted and now permit other and later claimants to water in Kansas to take water from, or tributary to or contributing to the flow of, the Arkansas River in Kansas which would otherwise be available.

At no time has the State of Kansas or its citizens sought to take or conserve any of the waters of the Arkansas River in Kansas by constructing reservoirs or storage facilities for the supply of the lands. There are now, and always have been, and will be in the future, at periods of the year, waters, and particularly flood waters, in the Arkansas River in Kansas which can be and could have been practically and economically conserved by storage in reservoirs in quantities sufficient to supply all of the needs which the State of Kansas or its citizens has or has had or may have in the future. There are now and always have been reservoir sites in the State of Kansas procurable for the storage of such waters, and at no great or disproportionate expense, or expense greater than that customarily incurred in the State of Colorado by appropriators in conserving the waters of the Arkansas River and preventing waste. Nevertheless the State of Kansas has allowed these waters in the State of Kansas to pass down the channel of the Arkansas River without use and to escape to the lower reaches of the river where irrigation is not practiced, and has allowed them to go to waste, whereas if it had expended or would expend time and effort and money in reasonable amounts, as Colorado has done, and with a desire to conserve and economically use the said waters and to protect and develop the natural resources within the State of Kansas, the said waters could have been and would be now and would in the future be available and sufficient for all of the demands of the state. The state, however, allows this waste to continue and takes and has taken no steps to prevent it, or to use the said unused natural resources of the Arkansas River. Only one reservoir, of inconsiderable capacity and never adequately or scientifically employed, now exists or has ever been constructed in Kansas.

The users of water in Colorado have never taken and do not now take all of the normal flow or all of the flood

waters of the Arkansas River on its course through the State of Colorado, and there are frequently times when the waters passing from Colorado into Kansas are of immense volume. Annually, the flow of water from Colorado alone into Kansas in the Arkansas River is more than sufficient, if properly taken and conserved in Kansas, to supply all of the irrigation demands of the Kansas claimants of water for irrigation.

The prayer of Kansas, even if it were just and well grounded, cannot be granted without the practical destruction of the greater part of the irrigation enterprises in Colorado, the return to aridity in Colorado of many times the acreage lying under Kansas ditches or susceptible of irrigation in Kansas from the Arkansas River, the waste of great quantities of water in transportation over arid stretches and enormous waste in other ways.

The water users of Kansas and the irrigators under its ditches are unthrifty and uneconomical in the use of water which is diverted into the ditches. They divert into the said ditches water which comes from the State of Colorado and also water coming from sources in Kansas and to which the State of Colorado has no access. The appropriators in Colorado, by careful and scientific use of the waters which they divert and conserve, have developed their lands. Nevertheless the appropriators of water in the Arkansas River drainage in Colorado take and receive, and for a long time past have taken and received from the said river and its tributaries, for irrigation, less water per acre than is taken and has in the past been taken and received from the said river in Kansas by the irrigation claimants in Kansas for their irrigated lands.

The entire irrigated area in the State of Colorado exceeds three million, three hundred thousand acres, and the lands irrigated in Colorado from the waters of the Arkansas

River about five hundred thousand acres, and the entire irrigated acreage in the State of Kansas does not exceed ninety thousand acres, and the lands in Kansas irrigated from the Arkansas River only about sixty-five thousand acres at most. There are many natural streams in Kansas from which water can be diverted for irrigation in Kansas and which are not available to Colorado appropriators; and by no act or deed charged in the complaint, or at all, has the State of Colorado or its citizens caused or contributed to any injury to the substantial interests of the State of Kansas or its citizens, or to the benefits to which they are entitled, nor has there been any such injury.

(d) The practice of irrigation in Colorado is steadily developing and improving the supply of water available on the lower stretches of the Arkansas River not only within the State of Colorado, but also across the Colorado-Kansas boundary. Continuous irrigation on the upper stretches of any stream such as the Arkansas River tends to raise the level of the ground waters in the drainage basin affected, to reduce the so-called duty of water, viz., the quantity of water required for the successful cultivation of a given area of land, to stabilize and increase the flow of water in the periods of minimum flow which occur in all prairie and mountain streams, to facilitate the carriage of both minimum and flood flows by keeping the sandy beds of the prairie streams moistened so that the flow is not lost by percolation and evaporation in the warm sand and in other respects to augment the economic availability of the water flow. As a general rule the development of irrigation first and most intensively on the upper stretches of western streams best accords with sound public policy, as such development permits the use of the water before it is subject to loss by percolation and evaporation through dry and arid stretches, permits the accumulation and return of percolating waters, which can be used over again repeatedly in the lower

stretches of the stream, and in other respects conserves the water supply and produces the maximum public benefit therefrom. These general statements, observable and recorded throughout the arid West, are all true both in theory and practice on the Arkansas River. Large quantities of water are now available on the Arkansas River in its lower stretches both in Colorado and in Kansas which originate in the return flow and percolation from water diverted above and applied through a long period of years upon lands bordering the river. A considerable quantity now used for irrigation in Colorado consists of these return waters, already once or more times employed for the cultivation of crops. Between the mountains and the Colorado-Kansas boundary numerous permanent streams have originated in the former dry channels which now contribute continually to the supply and flow of the river. These not only add to the total quantity of available water, and also add to the minimum flow during the critical spring and late summer months when the snow of the mountains is not melting, but tend to moisten and saturate the river bed so that the flood and maximum flow arising from melting snow in the early summer and from heavy precipitation during the late summer and fall months is carried with less loss, nearer the surface, for greater distances and in larger quantities. The amount and the beneficial consequences of this return flow have steadily increased in Colorado, most appreciably since the year 1900, and will undoubtedly augment in the future. Vast areas of former arid land along the Arkansas River in Colorado have by cultivation and irrigation become so saturated as to require drainage and have now been drained by artificial methods and these drainage channels carry and will continue to carry great quantities of water annually to the main river. The saturation has, moreover, steadily reduced the quantity of water originally required for irrigating a given acreage. The storage of water in the large reservoir systems of Colorado has a similar effect in the way of saturating the land

and contributing to return flows. As a consequence of these and other irrigation conditions in Colorado, there has developed at the Kansas-Colorado boundary a material and increasing normal flow which not only is supplying water for irrigation in Kansas heretofore unavailable, but keeps the naturally dry and losing stretch of river at the western margin of Kansas in a state to transport with less loss both the minimum and maximum flow of the river.

The Arkansas River, for many miles near the eastern boundary of Colorado and the western boundary of Kansas, has flowed through a broad, sandy bed which is affected by peculiar climatic and geological conditions and which has, until recent years, absorbed or destroyed not only the minimum flow of the river but even considerable floods. The attempted carriage of water across this stretch would be, in spite of improving conditions, exceedingly wasteful and uneconomical, and delivery of any given quantity of flow to a point east of the arid stretch, viz., in the neighborhood of the irrigation enterprises in the section of Garden City, would require, even under the present improved conditions, the surrender of a much larger quantity of flow by the ditches in Colorado, the practical cessation of irrigation in Colorado during some periods of the year and the destruction and abandonment of many irrigation enterprises in Colorado, even if practicable at all.

The State of Kansas is, as a whole, more prosperous than Colorado. Its agricultural resources are much more varied and the western counties, even those bordering the Arkansas River, have shown a gain in wealth and prosperity comparable with the remainder of the state. On the other hand, the Arkansas Valley in Colorado, being dependent, as it is, entirely upon agriculture based upon irrigation and resorting as it does to the most intensive and scientific use of irrigation, has revealed definite limitations to its development, has grown in wealth and prosperity much less markedly

than the Arkansas Valley in Kansas and has much less capability of definite expansion and improvement. Only through the slow processes, with the utmost public co-operation and the continued and undisturbed employment of its water resources can it continue to maintain even the present level of civilization and prosperity.

(e) The present development of agriculture in the Arkansas Valley has been based upon a public reliance and faith in its irrigation resources and institutions.

At all times since the organization of the then territory of Colorado, now the State of Colorado, in the year A. D. 1861, and from the earliest settlements within the territory now comprising the State of Colorado, the doctrine of the riparian right to the use of water has been and still is repudiated and denied in said territory and state, and the doctrine of the appropriation of water for irrigation and other beneficial purposes has applied, and been in force, priority of appropriation in point of time thereby giving the better right. In and by the Constitution of the State of Colorado adopted in the year 1876, the State of Colorado has claimed and declared that the water of every natural stream not theretofore appropriated within the State of Colorado belonged to the public, and was and is dedicated to the use of the people of the State of Colorado; and ever since said year the laws of the State of Colorado have provided for the appropriation of waters of the natural streams of said state by the people of the state, and within the state, to the exclusion of the right to the use of water by the people of any other state. The Legislatures of Colorado in the years 1879 and 1881 divided the state into irrigation districts, and provided a system for ascertaining, through appropriate court proceedings in the Colorado state courts, the various appropriations of water made in each of the irrigation districts of said state, to the end that the various appropriations so made should become a matter of record; and provided a system of water officials,

who, as executive officers of the state, should be and are charged with the duty of distributing the waters of the natural streams of the State of Colorado among the various appropriators of water within the said state, according to the amounts and dates of their several appropriations, as so fixed and determined by the courts of the said state.

The land situated in the Arkansas River drainage basin within the State of Colorado is dry, barren and unproductive, in its natural state, but is very fertile when cultivated by irrigation. Prior to the year 1860, ditches had been constructed and appropriations made, and the water applied to the beneficial uses of irrigating lands, in many localities on the Arkansas River and its tributaries in Colorado; and from the year 1860 the number of appropriations made, and the extent thereof, were steadily increased until about the year 1880, by which time a large proportion of the normal flow of said river, and its tributaries, was actually diverted and applied to the irrigation of the lands of the various appropriators in Colorado. From the year 1880, other canals and ditches were constructed, and appropriations made, in Colorado, of the waters of said river and its tributaries, and the water was thereby diverted and applied to the irrigation of lands under the respective ditches; all of which was done in good faith, under the belief that the State of Colorado and the people thereof were entitled rightfully and lawfully to appropriate and use all the waters of the streams of the state for irrigation purposes; and they have, ever since their respective appropriations, continued each and every year to divert the waters of said streams and use the same for irrigation purposes, and in so doing have provided permanent homes for many thousands of people, many of them coming from the State of Kansas, and purchasing and settling upon irrigated lands in the Arkansas Valley in the State of Colorado, and continuing to make their homes thereon down to the present time.

The counties in the State of Colorado whose prosperity depends largely upon the cultivation of the soil by irrigation from the Arkansas River and its tributaries are the counties of Lake, Chaffee, Custer, Fremont, Pueblo, El Paso, Huerfano, Otero, Crowley, Las Animas, Prowers and Bent, all situate in the Arkansas River Valley in said state; and as a result of the construction of said canals and ditches, and the diversion of water from said river and its tributaries, many populous towns and rural communities have been built up at a cost and outlay of many millions of dollars; and each and all of said communities have been and are prosperous as a result of the appropriation and use of the waters of said river and its tributaries, for irrigating the lands.

Beginning with the year 1899, the citizens of Colorado and others began to build sugar factories for the manufacture of sugar from sugar beets, the factories being located in various towns in said valley in Colorado, and the sugar beets being grown upon the irrigated lands of said valley; between the years 1899 and 1905, six sugar factories were built, having an aggregate capacity of about five thousand tons of beets per day, and at a cost of more than $5,000,000; and, in the necessary providing of equipment, tools and appliances for growing and harvesting the sugar beets, there has been expended and invested a large sum in addition to the cost of the factories, to wit: a sum greatly in excess of $1,000,0000. The business or industry of growing sugar beets on said irrigated lands and manufacturing sugar therefrom is one of the permanent and profitable industries of the State of Colorado, in which many millions of dollars are permanently invested.

Another permanent industry, in the matter of irrigating and farming of said lands, is that of growing alfalfa, there being in the Arkansas Valley in Colorado more than one hundred thousand acres in alfalfa, which produces three or

more crops of hay per year; and in connection with the growing of alfalfa, and the sugar beet industry, there has likewise grown up and has been established the industry of stock raising, in which many people are engaged and a vast amount of capital invested. It has also been demonstrated that the soil in the Arkansas Valley in Colorado and the climate of the said state are very favorable for the growing of fruits, berries, vines of all kinds and cantaloupes, and vast areas of said territory are planted with fruit trees and shrubbery, and vast areas used each and every year in the growing of garden truck, vegetables, seed crops, grain, corn and other like farm products, and in which industry many millions more of money have been permanently invested. The amount of lands so placed in cultivation in the Arkansas River Valley in the State of Colorado and irrigated from canals and ditches taking their water from said river and its tributaries, is more than 500,000 acres, and the cost of constructing said canals and ditches has exceeded $20,000,000.

The value of all said lands so placed under irrigation and in cultivation in the Arkansas Valley in the State of Colorado did not exceed, in the year 1881, $1,000,000, whereas about the year 1895 the value thereof, exclusive of the value of said canals and ditches, was more than $11,000,000; and at the time of the filing of the bill of complaint herein the value of all said lands, together with the improvements thereon, but exclusive of said canals and ditches, amounted to more than $100,000,000. All said investments were made and said values obtained by means of the diversion of the waters of said river and its tributaries for irrigation purposes, and by means of the labor and investment of the owners of said land, and upon the belief and understanding that said appropriations of water were rightfully and lawfully made, and said appropriators and users of the water for irrigation in the State of Colorado would continue

to have the right of enjoying the use of said waters of the Arkansas River and its tributaries for irrigating their various farms and tracts of land, free from any rights or claims of anyone making claims upon the waters of said Arkansas River out of the State of Colorado.

In the counties above named, that are located within the Arkansas River Valley in the State of Colorado, there are more than twenty cities and towns, and many villages, all of which are either chiefly or entirely dependent for their continued existence and prosperity upon the agricultural interests of said valley. Said cities, towns and villages, exclusive of the city of Pueblo, have a population of approximately 100,000 inhabitants; and the said city of Pueblo, which has itself a population of more than 50,000, is likewise largely dependent upon the agricultural interests of the valley for its maintenance and prosperity. Scores of school houses, churches and charitable institutions and factories of many kinds have been established and built and are being maintained in the agricultural communities in the irrigated district in said Arkansas River Valley in Colorado as the direct result of the irrigation of said lands and the settling up thereof, and these are likewise wholly dependent upon the continued irrigation of said lands, not only for their continued usefulness, but for their very existence. More than one hundred miles of special railroads have been built through said irrigated districts in the Arkansas Valley in Colorado, and as a direct result of the irrigation of the lands, that are dependent entirely upon the continued irrigation of the lands for the continued operation of said railroads. These special railroads so built are outside of and in addition to the main trunk lines of railroad located in said Arkansas Valley, which total more than five hundred miles and are dependent upon continuation and development of irrigation for a great part of their freight and passenger traffic.

All of the cities, towns and villages above mentioned and

referred to, exclusive of the city of Pueblo, that are situated in said Arkansas River Valley in the State of Colorado and that are dependent on the irrigation of said lands, amounted in the aggregate in the year 1881 to approximately 5,000 in population, and there has been a steady and rapid growth and increase in population ever since said year, due almost entirely to the development of the irrigated lands within said territory, the population having increased in the year 1895 to approximately 25,000 and to about 100,000 at the time of the filing of the bill of complaint herein. In the year 1881, the value of all the taxable property in the counties of Prowers, Fremont, Pueblo and Bent (which latter county then embraced the territory now constituting the County of Otero) amounted approximately to $8,500,000; while, by the year 1895, the taxable property in said counties, including the property in the County of Otero (which in the meantime had been created and formed out of a portion of the County of Bent), amounted to approximately $29,000,000; and by the time of the filing of the bill of complaint herein it had increased to approximately $75,000,000; and said values were obtained largely upon the irrigation of lands within said counties, and said increase in value was the direct result of the diversion of the waters from said Arkansas River and its tributaries, and the irrigation of the lands in said counties, as hereinbefore set forth.

In addition to the cities, towns and villages so located in and dependent upon the irrigation of the lands in said Arkansas River Valley in Colorado, there are approximately 50,000 inhabitants located outside of said cities, towns and villages, and upon the lands under irrigation and in cultivation in said Arkansas River Valley in the State of Colorado, and whose property investments and livelihood are absolutely dependent upon the continued use of the waters of said Arkansas River, and its tributaries, for irrigating their respective tracts of land for the purpose of growing crops

thereon, in the same manner as has heretofore been practiced by them, and without future hindrance or denial of said right to divert the water and to use the same for irrigating their said lands. Their supply of domestic water is also obtained largely from said Arkansas River.

Of the population of both of said towns and country, more than one-half is located under or adjacent to canals and irrigating systems deriving water from the Arkansas River in Colorado; and of the taxable property values hereinbefore alleged, approximately one-half thereof is located under or adjacent to said canals and irrigating systems in the State of Colorado; and said communities have been built up, and the population of the various cities, towns and villages and rural communities have been established and built up, and the growth in population and the increase in value of the taxable property, as hereinbefore set forth, have been due to the building of its respective canals and irrigation systems within the State of Colorado herein, and due to continued operation of its irrigation systems, and the diversion of the waters of said Arkansas River and its tributaries for the supplying of water for the irrigation of the lands lying under and adjacent to its canals. The future maintenance of the population in said communities, respectively, is dependent almost entirely upon the right of the State of Colorado, its citizens and inhabitants, to continue so to divert the waters of said Arkansas River and its tributaries without let or hindrance from anyone claiming the right to the use of the waters of the Arkansas River outside of the State of Colorado.

The construction of the canals, ditches and irrigating systems of the State of Colorado has been made openly and notoriously upon the faith of the claim made and asserted by the State of Colorado and its citizens that the waters of the natural streams of said state were subject to exclusive appropriation and use within the State of Colorado, all of

which was known to the predecessors in title and interest of the Finney Association herein, and to all other users and diverters of the waters of the Arkansas River in the State of Kansas, and with their acquiescence and silence, and their failure in any manner or at any time prior to their establishment to protest or to make any claim to, or to assert any right or interest in, the waters of said river as against existing appropriators, or those who should thereafter appropriate the waters of said river within the State of Colorado. Said cities, towns, villages and rural communities have been built up and populated, and the beet-sugar industry, fruit-growing, alfalfa-raising, garden-trucking, stock-feeding and other industries established, developed and placed upon a substantial and profitable basis, likewise openly and notoriously, and with the knowledge and acquiescence upon the part of said users in Kansas and the predecessors in title and interest to them, and of all diverters of waters from the Arkansas River in the State of Kansas, and without their having made any claim of right to the use of the waters of said river, or any part thereof, as against any existing or future appropriators of water from said stream in the State of Colorado, until the bringing of the litigation known as *Kansas vs. Colorado* in this Supreme Court. All of the growth and development in Colorado, as aforementioned, depended upon, and still depends upon, the exclusive use in Colorado of the waters of the Arkansas River as against all claimants beyond the said state, and such exclusive use has been practiced at all times heretofore. If the State of Colorado were now compelled to turn down the channel of the Arkansas River, for the use of any persons in Kansas, the whole or any part of the water demanded by the State of Kansas, the remaining flow of water in the Arkansas River in Colorado would be insufficient for the needs of the State of Colorado, and for the farms, towns, cities, industries, investments and population as aforementioned; and the prosperity of the Arkansas Valley in Colorado, and the

investment of the State of Colorado, would be destroyed, and the said valley would revert to its original arid and desert condition.

(f) The present exercise of the sovereignty of the State of Colorado in the diversion and use of water for agricultural, domestic and other beneficial purposes within the State of Colorado does not exceed the just limitations upon that sovereignty nor infringe the balance of equities between the State of Kansas and the State of Colorado, nor exceed any just or lawful limitations or restrictions upon the power and activity of the State of Colorado, its citizens, inhabitants and derivatives.

WHEREFORE, the State of Colorado prays that this Court may find and determine that the State of Kansas, in behalf of itself, its citizens, inhabitants and residents, has no just complaint against the State of Colorado or its citizens, inhabitants or residents on account of the matters at issue herein; that the State of Colorado and its citizens, inhabitants and derivatives may be quieted in their diversion, use and employment of the waters of the Arkansas River and its tributaries; that that part of the "Separate Answer of the State of Kansas" praying affirmative relief may be dismissed and that the prayer for relief in the original complaint herein made by the State of Colorado may be granted with costs.

ROBERT E. WINBOURN,
Attorney General
of Colorado.

JAMES GRAFTON ROGERS,
HENRY A. DUBBS,
FRED A. SABIN,
A. WATSON MCHENDRIE,
HENRY C. VIDAL,
Of Counsel.

Office Supreme Court, U. S.
FILED
APR 8 1920
CHARLES ELMORE CROPLEY
CLERK

FILE COPY

In the Supreme Court

of the United States.

No. [redacted]iginal, October Term, 192[redacted] 776

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

SEPARATE ANSWER OF THE STATE OF KANSAS.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,
JOHN G. EGAN,
Assistant Attorney-general of the State of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.

12-6668

In the Supreme Court of the United States.

No. 14 Original, October Term, 1928.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

SEPARATE ANSWER OF THE STATE OF KANSAS.

The state of Kansas, a state of the Union, by leave of court, files this its answer to the bill of complaint filed herein by the state of Colorado, and respectfully sets forth:

FIRST.

This defendant, the state of Kansas, admits the allegations in the first paragraph of the bill of complaint.

SECOND.

This defendant admits the allegations in the second paragraph of the bill of complaint.

THIRD.

This defendant admits the allegations in the third paragraph of the bill of complaint not herein denied, or as to which it states it is without knowledge.

This defendant denies that the Arkansas river is a nonnavigable stream, and denies that it flows for a distance of about 200 miles in Kansas; but alleges that it flows for a distance along the river of

about 370 miles through Kansas. This defendant denies that the slopes of the banks and the bed of the river are scarcely distinguishable from the flat contour of the open prairie; and alleges that said river in Colorado and Kansas has well defined and marked banks and bed. This defendant denies that along the course of said river in Colorado, there are no material sources of water either in wells or subterranean flows; and denies that more than a few of the cities, towns, villages and hamlets in Colorado are dependent upon the waters flowing in the channel of said river for domestic and manufacturing uses, fire protection, and the customary requirements of a population; and denies that the annual precipitation in the form of snow and rain in the lands in Colorado bordering said river and its tributaries gradually increases from a minimum of about 10 inches per annum where the river first ceases to be a mountain stream, and becomes available for agricultural and domestic use, to about 15 inches per annum at the eastern border of Colorado; but alleges that such annual precipitation gradually increases from about 12 inches per annum where the river first ceases to be a mountain stream to about 16 inches per annum at the eastern boundary of Colorado. This defendant denies that a large part of the population of Colorado is dependent upon the use of the waters flowing in said river and its tributaries for carrying on the arts and industries of life and for maintaining existence; and denies that fourteen counties in Colorado, namely, Lake, Chaffee, Custer, Fremont, Pueblo, El Paso, Huerfano, Otero, Crowley, Las Animas, Baca, Kiowa, Bent and Prowers, are dependent upon said river and its tributaries within Colorado for the fundamental requirements of life; and denies that more than 640,000 acres devoted to agriculture in Colorado are, and for many years have been, entirely dependent upon the Arkansas river and its tributaries for irrigation water, and would, without its continued use and availability, revert to deserted prairies within

a few months; and denies that the cities of Salida, La Junta, Lamar, and a large number of smaller cities, towns and settlements are dependent for water upon the natural discharge of said river and its tributaries.

This defendant is without knowledge whether more than $20,000,000 has been expended in the construction of ditches and canals for agricultural purposes, and as much more in the construction of municipal and manufacturing facilities for the diversion and use of water by cities, towns and the industries located within them, in the basin of the Arkansas river and its tributaries in Colorado.

This defendant denies that since the year 1900 there has been no substantial alteration in the quantity of water beneficially applied within Colorado from the Arkansas river and its tributaries.

FOURTH.

This defendant admits the allegations in the fourth paragraph of the bill of complaint not herein denied.

This defendant alleges that the rainfall and snowfall in the lands along the course of the Arkansas river in Kansas for a distance of about 190 miles from the western line of the state are not sufficient for the growth of crops and the support of settlements without the aid of irrigation; but denies that in such district irrigation has been practiced spasmodically; and alleges that within such district irrigation has been practiced regularly when water has been obtainable from the Arkansas river; and admits and alleges that prior to 1900 over 70,000 acres of agricultural land derived, and has since when water could be obtained from the river, continued to derive water from the said river within the state of Kansas, but that such use has not been supplemental in ordinary years, but has been principal in such years when the water could be obtained, and has also been the principal use in years of unusual drouth; and denies that by reason of natural conditions in such district the state of Kansas has

not been required to develop and has not developed irrigation institutions, irrigation structures and irrigation laws and practice at all comparable with those developed in Colorado; and denies that the riparian doctrine prevails in such district in the state of Kansas; and alleges that the state of Kansas has developed irrigation institutions, irrigation structures and irrigation law and practices governing such district, but that by reason of the taking of the water from said river and its tributaries in Colorado by authority of the state of Colorado, the flow of water in said river into Kansas from Colorado has been steadily and continuously diminished in all the period from the year 1880 to the year 1928, inclusive; and that as a result thereof the development of irrigation in that district in the state of Kansas has been greatly obstructed, diminished and delayed, and the maintenance and conduct of irrigation in that district in Kansas has been greatly injured and diminished.

This defendant alleges that the statutes of Kansas have authorized the taking and use of water for the purposes of irrigation of agricultural lands and incidental purposes since the year 1868, and states that:

In 1868 it was provided that private corporations could be organized for the construction and maintenance of canals for irrigation (sections 4 and 5, chapter 23, pp. 191, 192, General Statutes of Kansas, 1868), and canal corporations for the purpose of irrigation were authorized to construct canals and to furnish water for irrigation at rates which they might fix (section 89, chapter 23, pp. 214, 215, *id.*).

In 1876 authority was given to condemn lands for the use of irrigation corporations, and it was provided that the waters of a stream could not be taken for irrigation in such manner as to interfere with, hinder, delay or injure any milling or irrigating improvements already constructed upon the stream, or to diminish the supply of

water to or through any established irrigation canal; and an irrigating company was permitted to sell or lease its water, and to convey water by means of pipes or canals. (Sections 1 and 2, chapter 58, Session Laws of Kansas, 1876.) This statute took effect upon March 15, 1876, and before Colorado became a state of the Union.

In 1885 a lien was granted upon a crop raised by irrigation on account of water furnished on a contract for such irrigation (chapter 133, Session Laws of Kansas, 1885), and a penalty was imposed for certain willful or malicious injuries to a ditch or canal used for irrigation (chapter 134, Session Laws of Kansas, 1885).

In 1886 authority was given to appropriate water flowing in a river or stream for the purpose of irrigation. It was provided that the appropriator first in time should be first in right; the place of diversion could be changed if the change could be made without injury to others; an irrigating canal could be extended, and provision was made for the method of posting a notice in order to appropriate water (sections 1 to 5, inclusive, chapter 155, Session Laws of Kansas, 1886), and the acquisition of title for right of way to a canal by lapse of time was regulated. (Sections 6, 7 and 8, *id.*)

In 1891 it was provided that in that portion of Kansas west of the 99th meridian (and which meridian intersects the Arkansas river at a point about 160 miles in a direct line east of the west line of Kansas) all natural waters could be diverted first to irrigation in aid of agriculture, subject to ordinary domestic uses, and, second, to other industrial purposes, but no diversion could diminish or divest any prior vested right of appropriation for the same or a higher purpose, without condemnation and compensation (section 1, article 1, chapter 133, Session Laws of Kansas, 1891).

It was provided that the appropriation of water could be effectual only as to so much as should be actually applied to beneficial uses within a reasonable time after the commencement of the irrigation

works. Section 2 and section 7, article 1, *id.*) The appropriation and use of water and priority of rights thereto for irrigation were regulated by this act in extensive detail.

By another act of 1891, there was an amendment to the prior statute on the subject of condemning land for right of way for irrigation and other purposes; but waters of a stream could not be taken in such a manner as would interfere with, hinder, delay or injure any milling or irrigation improvement already constructed or located upon the stream, or diminish the supply of water flowing to or through an established irrigating canal (chapter 85, Session Laws of Kansas, 1891).

In 1899, the last-named statute was again amended but did not restrict the provisions referred to. In the same year the condemnation of lands was authorized for a reservoir for the storage of water for irrigation (chapter 152, Session Laws of Kansas, 1899).

In 1923 in the revision of the statutes, the subject of irrigation was fully treated; corporations could be organized for irrigation purposes; authority was given to condemn the right to take water for irrigation from any stream in Kansas; the methods of condemnation were prescribed; the right to take water flowing in a stream for irrigation continued to be recognized; the method of initiating the right was regulated; rights of way for irrigation canal could be condemned.

Among other things, the substance of the provisions in chapter 133, Session Laws of Kansas, 1891, concerning the appropriation and use of waters for irrigation west of the 99th meridian were carried into the revision. (Sections 17-202 and 42-109 to 42-329, inclusive, Revised Statutes of Kansas, 1923.)

Copies of portions of the Kansas statutes hereinbefore referred to and index references to other portions are attached to this answer as Appendix A, and made a part hereof.

FIFTH.

This defendant admits the allegations of fact in the fifth paragraph in the bill of complaint not herein denied.

This defendant alleges, whatever may be the constitution, laws or administrative system of Colorado, that neither of them has any extraterritorial effect, or is binding upon this defendant, or in any way invalidate or qualify its rights and those of its citizens and residents as hereinafter set forth.

This defendant denies that Colorado owns all of the flowing water within the limits of that state, and especially the flowing water of the Arkansas river and its tributaries; and alleges that the same is an interstate stream and the waters therein must be shared equitably between the citizens and residents of Colorado and the citizens and residents of Kansas.

This defendant denies that the conduct of Colorado in regard to the appropriation and use of water for irrigation and other purposes in Colorado has been actually in subordination to those limitations which this court has determined to exist as between Colorado and other state or states, and alleges that the conduct of Colorado in such matters has been without regard for and in violation of the rights of Kansas and of the citizens and residents of Kansas, and in violation of the decisions of this court. This defendant denies that the conduct of Colorado in such matters has been in a sovereign capacity.

SIXTH.

This defendant admits the allegation of the sixth paragraph of the bill of complaint, excepting those herein denied.

This defendant denies all of the conclusions of law set forth in said paragraph, and alleges that said paragraph is composed almost entirely of a legal argument and citations of authorities which have

no place in a bill of complaint, and which this defendant will meet upon the final argument of this case.

This defendant further states that this court will take judicial notice of the constitution and laws of Colorado, and will interpret and apply or refuse to apply the same in its final judgment.

This defendant denies that Colorado has assumed responsibility in a sovereign capacity for such obligations, if any, with regard to the water flowing in the Arkansas river as it bore to Kansas; and denies that Colorado has recognized the procedure provided by the Constitution of the United States for the settlement of any claims against Colorado by means of compacts between the states, and by means of the determinations of the Supreme Court of the United States; and denies that any appropriations which have been made by sessions of the Colorado legislature have been for the defense of any sovereign rights of the state of Colorado in the Arkansas river and the water flowing therein; and alleges that whatever rights Colorado has to the water flowing in the Arkansas river, or its tributaries in Colorado, are not sovereign, but are qualified and limited, among other things, by the rights of Kansas and citizens and residents of Kansas.

This defendant alleges that the laws of Colorado and the administration thereof under its direction and authority have operated to appropriate for the use of irrigators in Colorado water flowing in the Arkansas river and its tributaries in Colorado which this defendant and its citizens and residents have a right to be permitted to flow from Colorado into Kansas, and have a right to use the same for municipal, domestic, manufacturing and irrigations purposes in the valley of the Arkansas river in Kansas.

SEVENTH.

This defendant admits the allegations in the seventh paragraph of the bill of complaint not herein denied, or as to which this defendant states it is without knowledge.

This defendant denies that the claims to the use of water from the Arkansas river and its tributaries in Colorado for irrigation in that state constitute rights as against the state of Kansas, its citizens and residents; and denies that those claims are limited in quantity to the necessities of time and place and of economic utilization; and denies that the diversion of water by such claimants depends upon an acquaintance and intimate knowledge of time and place of use, and requires the constant exercise of human discretion. This defendant denies the water in the Arkansas river and its tributaries in Colorado is owned by that state, and denies that under the administration of water by Colorado a uniform use with a maximum economy and consideration of the public welfare is maintained, and that any interruption of such administration would effect confusion or come into collision with express provisions of the laws of Colorado, or produce serious public consequences or disaster to the general welfare of the citizens and residents of Colorado. This defendant denies that any adjudication in favor of claimants to the use of waters in Kansas from the Arkansas river against any appropriators of water in Colorado would result in the destruction of the governmental system maintained by Colorado, or would be in collision with statutory provisions of Colorado, or would disrupt the governmental system of Colorado with respect to water, or would be impossible of intelligent or lawful administration, or would produce public disorder.

This defendant is without knowledge as to the compacts alleged by the plaintiff concerning water in interstate streams between Colorado and other states, but denies that there is any compact

now in process of negotiation between Colorado and Kansas concerning the use of waters flowing in the Arkansas river.

This defendant denies that the climatic zones are materially different along the Arkansas river from the base of the mountains in Colorado to a point measured along such river about 190 miles east of the west line of Kansas; and alleges that in the portion of the Arkansas valley last referred to in Kansas it is necessary for successful farming that irrigation should be practiced.

This defendant does not admit the conclusions of law and legal argument set forth in paragraph seven in the bill of complaint, and states that matters of legal argument should not be set forth in the bill of complaint, but should be heard upon the final hearing of this case.

EIGHTH.

This defendant admits the allegations contained in paragraph eighth of the bill of complaint, but denies the conclusions of law and legal argument contained therein.

This defendant alleges that in the case of *Kansas v. Colorado*, the bill of the state of Kansas was dismissed without prejudice to its right "to institute new proceedings whenever it shall appear that through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river"; and denies that in said case this court determined that the quantity of water represented by the appropriations and diversions existing and carried on within the state of Colorado, under its authority in the year 1907, was within the lawful rights of Colorado, its corporations and citizens; and denies that the continuance of such appropriations and diversions was in legal effect quieted to Colorado, its corporations and citizens.

NINTH.

This defendant denies that in reliance upon the adjudication in *Kansas v. Colorado*, the residents and citizens of Colorado have continued the diversions and use of the waters of the Arkansas river to the extent only that the same existed and were in actual use at the dates included within the issues and testimony in said case; and alleges that Colorado and its residents and citizens have, since May 20, 1901, the date of the filing of the bill of complaint in the case of *Kansas v. Colorado*, greatly increased the diversion and use for irrigation, and for agricultural purposes, of water of the Arkansas river and its tributaries in Colorado, and have so continued to do until the filing of the bill of complaint in this case, on or about January 3, 1928; and that at the last mentioned date and for a long time prior thereto Colorado and its residents and citizens, by its permission and asserted authority, diverted and used for irrigation for agricultural purposes in Colorado, the waters of the Arkansas river and its tributaries to a much greater amount than they had diverted and used the same for such purposes at the time of the filing of the bill of complaint in *Kansas v. Colorado*.

This defendant alleges that Colorado, its residents and citizens, under its permission and aid and with its asserted authority, have during the same period greatly increased the number, extent and capacity of reservoirs and ditches for the taking of water from the Arkansas river and its tributaries in Colorado for irrigation for agricultural purposes, and greatly increased the acreage which has been irrigated in Colorado by the use of waters from the Arkansas river and its tributaries, either directly or through such reservoirs. During the period therein from 1909 to 1912, inclusive, the construction of at least twenty-three reservoirs to store water from the Arkansas river or its tributaries in Colorado was authorized by the state engineer of Colorado, and such authorization is shown by the published

reports of said engineer. Most of such reservoirs have been constructed and used for the purpose aforesaid. A list of such reservoirs so authorized is set forth in Appendix B, attached hereto and made a part hereof.

This defendant states that the number of acres of land irrigated for agricultural purposes in Colorado from the waters of the Arkansas river and its tributaries in the year 1900 was about 317,015, and in the year 1926 was about 544,876, an increase of over 71 per cent. In that period, with some mutations, there was a course of increase of such acreage. Approximately the number of acres so irrigated in Colorado for the biennial years 1900 to 1926, excepting three of such years for which the biennial reports contain no record on that point, is set forth upon appendix C, attached hereto and made a part hereof, and the same are shown upon the published biennial reports of the state engineer of Colorado.

This defendant denies that no material increase has been made in Colorado in the depletions of the water of said river and its tributaries, and denies that the substantial interests of Kansas have not been detrimentally altered by the taking of such waters in Colorado, or that the equitable apportionment of benefits by use of the waters of said river have not been disturbed since the dates included within the issues and testimony in said case of *Kansas v. Colorado;* and denies that any changes in the meantime are immaterial; and denies that at the time of the filing of the bill of complaint in this case the waters flowing by the Arkansas river into Kansas vastly exceeded the quantity to which Kansas, its citizens and residents, were entitled under any doctrine of equitable apportionment.

This defendant alleges that from the time of the filing of the bill of complaint in *Kansas v. Colorado,* continuously until the time of the filing of the bill of complaint in this case, the amount of water taken in Colorado from the Arkansas river and its tributaries by

Colorado, or by its residents or citizens, under its permission, aid or asserted authority, has been greatly increased; and that the depletion of the water of the Arkansas river flowing into Kansas has thereby been greatly increased; and that the substantial interests of Kansas, its residents and citizens, have been detrimentally altered by said conduct of the state of Colorado, its residents and citizens.

This defendant denies that Colorado has not materially altered the quantity of water available within the state of Kansas since the filing of the bill of complaint in the case of *Kansas v. Colorado;* and alleges that Colorado, its citizens and residents, have greatly increased the taking and use of water from the Arkansas river and its tributaries in Colorado during the period mentioned, all to the expense and injury of Kansas, its residents and citizens; and alleges that thereby irrigation of agricultural lands from the waters of the Arkansas river in Kansas has been greatly injured, obstructed and diminished.

TENTH.

This defendant admits the allegations in paragraph tenth of the bill of complaint not herein denied, or as to which it states it is without knowledge.

This defendant is without knowledge whether the taxable value of lands and property in Colorado dependent upon the water in the Arkansas river and its tributaries in Colorado has substantially increased since the year 1907, or whether in that period there have been substantial additions to various municipal and state properties in Colorado; but if there have been any such increases this defendant denies that the same have been based upon any reliance of Colorado, its residents and citizens, upon the adjudication of this court in the case of *Kansas v. Colorado;* and denies that any expenditures and any labor and investigation by Colorado in reference

to the appropriation and use of water for irrigation in Colorado from the Arkansas river and its tributaries has been in reliance upon such decision; but alleges that any such actions of Colorado have been in violation of that decision.

ELEVENTH.

This defendant admits the allegations of paragraph eleventh of the bill of complaint not herein denied.

This defendant denies that any suits which have been brought by residents or citizens of Kansas against residents or citizens of Colorado have been in defiance of the principles laid down in the case of *Kansas v. Colorado;* but alleges that any suits which have been so brought have been brought to enforce a priority of rights of water appropriation of irrigators in Kansas as against irrigators in Colorado under the well settled adjudications of the lower federal courts and of this court; and that such suits have been brought and maintained to assert individual rights of priority which were never considered or adjudicated in the case of *Kansas v. Colorado;* and this defendant denies that Colorado was a necessary party to either of those three suits, or to the two suits now pending brought by the Finney County Water Users' Association in the United States District Court for Colorado, and referred to in the bill of complaint; and alleges that all of such suits were and are private suits to establish private rights.

TWELFTH.

This defendant admits the allegations of the twelfth paragraph of the bill of complaint which are not herein denied, or as to which it states it is without knowledge.

This defendant has no knowledge as to the defenses made by the defendants in the three cases in the United States District Court for Colorado referred to in said paragraph, or as to the rulings of said court, or as to whether said court will finally adjudicate the

rights of the Finney County Water Users' Association as against the defendants in the two cases brought by said association.

This defendant denies that the issues presented in the suit brought by the United States Irrigating Company in the United States District Court for Colorado against the Graham Ditch Company *et al.*, were adjudicated in this court in the case of *Kansas v. Colorado;* and denies that the United States Irrigating Company in that suit sought to have its increased superiority of appropriation enforced without regard to the policy of Kansas. This defendant is without knowledge whether the plaintiff in said suit alleged that Colorado had exceeded its equitable and relative rights in the flow of the river as determined in the case of *Kansas v. Colorado;* and is without knowledge whether it is against the practice, procedure and law of Colorado that water officials must be joined as defendants in any suits affecting relative priorities or the diversion and use of waters of the streams in Colorado; and is without knowledge whether the plaintiff in said suit pleaded the litigation and conclusion of the case of *Kansas v. Colorado;* or whether it appeared in the bill of complaint in said suit that all of the defendants therein had been operating through themselves, or their predecessors in interest, the same irrigation enterprises, or had been claiming the same rights prior to the litigation in *Kansas v. Colorado;* but denies that such matters had been fully presented in *Kansas v. Colorado;* and alleges that the issues in said suit in the district court for Colorado had not been determined in the case of *Kansas v. Colorado.*

This defendant admits that some, but denies that others, of the defendants in said suit in the United States District Court had, either in their own persons or through direct predecessors in interest, been named as individual defendants, and had pleaded as such in the case of *Kansas v. Colorado.* This defendant denies that the District Court in said suit assumed the right to determine the rela-

tive rights of Colorado and Kansas in the waters of the Arkansas river; and denies that the defendants therein bought the dismissal of said suit by the payment of a money consideration to the plaintiff.

This defendant denies that the Finney County Water Users' Association was led to bring either of its suits in the United States District Court for Colorado by any success of the United States Irrigating Company in its suit; and denies that any rights asserted in the suit by the Finney County Water Users' Association had been pleaded, considered and adjudicated in the case of *Kansas v. Colorado.*

This defendant is without knowledge whether either bill of complaint filed by the Finney County Water Users' Association was substantially a verbatim copy of the bill of complaint filed by the United States Irrigating Company; or that it contained the same general allegations, or stated the same cause of action against the same defendants.

This defendant is without knowledge as to whether there were many errors in either bill of complaint filed by the Finney County Water Users' Association. This defendant admits that some of the defendants, but denies that others of the defendants in said suits last named, either themselves or through predecessors in interest, were included among the defendants impleaded in the case of *Kansas v. Colorado;* but denies that the rights, history, acts and appropriations of the Finney County Water Users' Association and of the defendants in either suit brought by it were involved in, presented, litigated, considered or determined in the case of *Kansas v. Colorado;* and denies that the consequences of the acts, diversions and claims of both were fully presented, involved and litigated in the case of *Kansas v. Colorado;* and denies that any such matters appear of record in the case of *Kansas v. Colorado.* This defendant denies that in either of said suits brought by the Finney County

Water Users' Association, the United States District Court for the district of Colorado has announced its intention to determine the limits of the equitable benefits of Colorado and of Kansas to the waters flowing in the Arkansas river; and denies that the plaintiff in either of said suits, unless prevented by this court, will proceed to litigate in the Federal District Court any rights or claims of Colorado.

Referring to the second suit brought by the Finney County Water Users' Association in the United States District Court in Colorado against the Coler Ditch and Reservoir Company *et al.*, this defendant denies that no reason appears for the selection of the defendants in said suit; and denies that many of the defendants therein have no interest in the actual diversion and application to beneficial uses of waters of the Arkansas river. This defendant is without knowledge whether Colorado is unable to determine any system or theory on which the defendants in said last named suit were selected, or whether the defendants therein have any scattered priorities for the use of water. This defendant is without knowledge as to whether any towns or cities are not made parties defendant in said last named suit; or whether the defendants in the last named suit brought by the Finney County Water Users' Association are interested in asserted priorities, the places of taking and using of which are a long distance from each other.

This defendant denies that by either of said two last named suits the Finney County Water Users' Association will endeavor to cause to be adjudicated the relative rights of Colorado in the benefit of the waters in said river as against Kansas; and denies that the said district court has announced its determination and duty to make any such adjudication.

This defendant is without knowledge whether there are also ditches in Kansas, located between the ditches of the Finney County

Water Users' Association and the Colorado boundary, for which are asserted claims equal to or better than those of said association. This defendant denies that the said district court has decided to determine the present extent of the diversion, uses and needs of the whole state of Kansas and the whole state of Colorado, and the relations of the uses and depletions of the waters of the Arkansas river in Colorado and in Kansas in said two last-named suits. This defendant is without knowledge as to the contentions made by the defendants in said two last named suits.

This defendant alleges that many of the allegations contained in said paragraph twelve of the bill of complaint are immaterial and many are conclusions of law.

This defendant alleges that it represents other irrigators in Kansas than the United States Irrigating Company and the Finney County Water Users' Association.

THIRTEENTH.

This defendant admits the allegations of the thirteenth paragraph of the bill of complaint not herein denied, or as to which this defendant states it is without knowledge.

This defendant is without knowledge whether the claims to the appropriations and use of water for the purpose of irrigation in Colorado of many of the defendants in the suit by the United States Irrigating Company and in the two suits by the Finney County Water Users' Association, in the United States District Court for Colorado, hereinbefore referred to, were initiated, valid, effective or in use under the ordinary doctrine of appropriation prior in date to the filing of the bill of complaint in the case of *Kansas v. Colorado*.

This defendant denies that any of the rights or claims of the Finney County Water Users' Association were included, considered, or adjudicated by the decree in the case of *Kansas v. Colorado*, or

that said association is in any wise bound by said adjudication, or that the same is *res judicata* as between said association and any individual appropriators or users of water in the state of Kansas, or in the state of Colorado, or as between said association and the state of Colorado.

FOURTEENTH.

The defendant admits the allegations in the fourteenth paragraph of the bill of complaint not herein denied, but does not admit any conclusions of law, and alleges that many of such allegations are immaterial.

Referring to the two suits brought by the Finney County Water Users' Association in the United States District Court for Colorado, this defendant is without knowledge whether by any adjudication therein any appropriators of water in Colorado, not made parties defendant in those two suits, would be able to maintain, as against the Finney County Water Users' Association, any claim to the use of water, or would be permitted to use any water which the defendants in said suits would not be permitted to use; and is without knowledge whether there will be any further attempts to adjudicate water rights in the United States District Court for Colorado in addition to the attempts by means of those two suits; and is without knowledge whether said District Court would be free to appoint separate administrative officers to enforce in Colorado the rights of any Kansas claimants to the use of water.

This defendant denies that any adjudication which might be entered in either of said two suits in the United States District Court for Colorado, if the plaintiffs should recover, would take the form of a determination that the plaintiff is entitled to assert its priority without regard to the state of Colorado or the state of Kansas, or the systems of distribution and the laws of each of said states; and denies that by any such adjudication any such ownership by Colo-

rado (if any such there be), and the administration of Colorado would be disrupted and destroyed; and denies that any decrees in either of said two suits would require discretionary administration; and denies that any such decree could not anticipate recognition and obedience by parties not before it or by state officials; and denies that said District Court has not, or would not have, judicial machinery to make such decree effective without waste of water or great injustice. This defendant denies that any decree in any suit other than said two suits would arrive at different estimates and adjudications of the relative rights of the parties. This defendant denies that there is development in the use of returned water in Colorado along the Arkansas river or tributaries thereof; that is, waters flowing or percolating back to the stream after irrigating use; and denies that many factors are producing changes which require water administration to adapt itself constantly to new conditions; and denies that the evolution of the Colorado system of water administration is still in process. This defendant denies that any attempt by decree of court to interfere in the details or lay down rules in respect to the claims for the use of water of residents or citizens of either state will retard the development and the administrative machinery of Colorado, and destroy any benefits already obtained therefrom; and denies that any attempt by decree of court to enforce the recognition of the rights of any particular appropriator of water in Kansas as against any appropriator of water in Colorado would be destructive of public order, or would be impossible of intelligent administration or obedience, or would produce waste and destruction of the water resources claimed by either state; and denies that any adjudication or modification of the rights of an appropriator or group of appropriators in Colorado affects, disturbs and interferes with other appropriators and diverters of water in Colorado, or disturbs and affects the system of initiation, adjudi-

cation and administration of water in Colorado; and denies that to regulate the diversion of water to enforce the individual claims of a water appropriator in Kansas would affect or substantially destroy the jurisdiction of Colorado over the administration of the waters of the Arkansas river and its tributaries; and denies that any such adjudication would contradict or interfere with the daily administration of water diversions upon the Arkansas river or its tributaries in Colorado, or the operations of the officials of Colorado in water administration; but alleges that the administration of such water diversions and the operations of the water officials of Colorado would be required to be in harmony with and in obedience to such adjudication; and this defendant alleges that it would be practicable to have the administration of water diversions and the operations of the water officials of Colorado subordinate to and in harmony with any such adjudication. This defendant denies that any determination of the rights of individual Kansas appropriators of water against individual Colorado appropriators of water is impossible of performance or of intelligent obedience, or would affect and confuse many irrigation users in Colorado; and denies that any court injunctions as between appropriators of water in Colorado and in Kansas would collide with the action of any state water officers of Colorado, or would disrupt the water administration of Colorado.

FIFTEENTH.

This defendant is without knowledge concerning the subject matter of the following-described allegations of the fifteenth paragraph of the bill of complaint; that is:

(*a*) Whether Colorado owns the Monument Reservoir in El Paso county, Colorado, diverting and storing water from Fountain creek, a tributary of the Arkansas river, and administered as a reservoir

having a priority, the waters of which are distributed among appropriation owners on the stream below.

(b) Whether Colorado has constructed and owns the Boss Lake Reservoir in Chaffee county, Colorado, diverting and storing water from Cottonwood creek, Chalk creek and the South Arkansas river, tributaries of the Arkansas river, which is administered as having a reservoir priority, and the waters thereof distributed among the appropriators on said stream.

(c) Whether in connection with the State Penitentiary at Canon City, Colorado owns and operates a farm and applies thereon water from the Arkansas river, diverted through the Canon City Hydraulic and Irrigating Ditch, and also uses water for irrigation purposes from the Arkansas river diverted through the municipal diversion system of Canon City, and also uses the Union Mill Ditch, used for power purposes.

(d) Whether in connection with the State Hospital for the Insane at Pueblo, Colorado carries on considerable farming operations for the support and use of said institution, diverting water through the West Pueblo Ditch under various usufructuary rights assigned to said ditch on the Arkansas river, with priorities of various dates from 1872 to 1883.

(e) Whether in connection with the State Institution for the Deaf and Blind at Colorado Springs, Colorado irrigates and uses for domestic purposes water diverted from tributaries of the Arkansas river through the diversion system of Colorado Springs, under usufructuary rights granted said city.

(f) Whether in connection with the State Reformatory located at Buena Vista, Colorado carries on extensive farming operations by irrigation from the Arkansas river and various tributaries, and is the owner of water rights under the Maynard Ditch, the Cotton Creek Irrigation Ditch and the Gold Nugget Ditch, and has under

lease the benefit as lessee of extensive water rights from the Dry Creek Ditch, the Helena Ditch, the Bray Ditch, the Harmony Ditch, the Gold Nugget Ditch and the Fish Ditch, from the Arkansas river and its tributaries.

This defendant alleges that whatever may be the rights of Colorado to said irrigations, Colorado has appeared in this case, submitted to the jurisdiction of the court, and that the claims above alleged by Colorado, if they should be sustained, will be fully protected.

This defendant alleges that the claims of Colorado in connection with said reservoirs, ditches and irrigation undertakings hereinbefore in this paragraph referred to, are subordinate and inferior to the claims and rights of the state of Kansas, its residents and citizens, to take and use water from the Arkansas river in Kansas for irrigation, domestic and municipal uses.

This defendant denies that the adjudication by any court, which does not have jurisdiction of Colorado, its officials and property, that a resident or citizen or water appropriator in Kansas is entitled to require the cessation of diversion or use of water, at any time by any residents or citizens of Colorado, would affect the usefulness and value of any of said reservoirs, ditches or irrigation claims asserted by Colorado; and denies that any claims of Colorado to waters of the Arkansas river and its tributaries would be substantially affected; or that the administration of the waters of the Arkansas river and its tributaries in Colorado would be confused, or hampered, or that any investments of Colorado in canals, state charitable or penal institutions and other state properties would be diminished or destroyed.

SIXTEENTH.

This defendant admits the allegations of the sixteenth paragraph of the bill of complaint not herein denied.

This defendant admits that some negotiations occurred between Colorado and Kansas pursuant to article 1, section 10, clause 3 of the Constitution of the United States, with respect to their respective rights as states in and to the water of the Arkansas river; but denies that any such negotiations were for the purpose of determining the several rights of residents or citizens in Kansas as against residents and citizens in Colorado to the appropriation and use of the water in the Arkansas river; and alleges that no compact or agreement has been effected or made between said two states upon said subject; and that all negotiations and discussions between said two states and their representatives upon said subject have been terminated and abandoned, and had been several years before the filing of the bill of complaint in this case.

This defendant is without knowledge whether there have been negotiations for flood protection for the benefit of the states of Oklahoma and Arkansas which would involve construction in Colorado of dams for irrigation storage and flood restraint by the aid and partially for the benefit of the lower states; but denies that there have been negotiations between Kansas and Colorado on such subject.

This defendant denies that the pendencies of litigation and the possibilities of judgment as between residents or citizens in Kansas and in Colorado, in the cases in the United States District Court for Colorado hereinbefore referred to, have hampered, or do hamper, or threaten to render useless, meaningless and nugatory any efforts of Colorado and Kansas to settle any such matters by compact; and denies that, unless prevented by proper authority, said District Court threatens to proceed and will proceed to enter decrees as be-

tween individual parties which will complicate, embarrass and render ineffective any power, duty or opportunity of Kansas and Colorado to make a compact and agreement concerning the conservation or use of waters flowing in the Arkansas river.

SEVENTEENTH.

This defendant admits the allegations of the seventeenth paragraph of the bill of complaint not herein denied.

This defendant denies that any private rights which exist within the state of Kansas to the use of water from the Arkansas river are derived solely from Kansas under any policy that it may adopt, or from any doctrine that it may from time to time develop; but alleges that Kansas has sanctioned and authorized the use of water within its territory for the purpose of irrigation from the Arkansas river. This defendant denies that any and all rights to use water from the Arkansas river in Kansas, or said river and its tributaries in Colorado, are to be determined, or the quantity thereof allocated, by compact between said states. This defendant denies that Colorado and Kansas are sovereign states, but alleges that they have each a qualified or limited sovereignty. This defendant denies that any progress which may have been made in Colorado in the economic application and use and development of waters for irrigation or other purposes has been in reliance upon the adjudication in the case of *Kansas v. Colorado;* and denies that the distribution of water in Colorado has been wise; and denies that the quantity of water which Colorado has permitted to be taken and distributed from the Arkansas river and its tributaries in Colorado is only that which it is entitled to divert or permit to be diverted from said streams; and alleges that Colorado and its citizens and residents, by its aid and permission, have diverted from the Arkansas river and its tributaries in Colorado large quantities of water which

Kansas and its residents and citizens have a right to be permitted to flow in said river from Colorado into Kansas.

This defendant denies that the institution and maintenance of the said three suits, in the bill of complaint referred to, in the United States District Court for Colorado, one by the United States Irrigating Company, and the other two by the Finney County Water Users' Association, have been in violation of the determination of this court in the case of *Kansas v. Colorado*, or that any decree in either of said suits in favor of the plaintiff therein has been, or would be, in violation of such determination, or has, or would, lay any servitude on territory in Colorado, or would be in defiance of the adjudication in the case of *Kansas v. Colorado*.

EIGHTEENTH.

This defendant admits the allegations in the eighteenth paragraph of the bill of complaint not herein denied, or as to which it states it is without knowledge.

This defendant denies that the said two suits by the Finney County Water Users' Association in the United States District Court for Colorado are maintained and presented in pursuance to rulings by said court and the judge thereof; but alleges that under the rulings of said court and of said judge, the said association has the right to maintain and present such suits. This defendant is without knowledge whether the adjudication in such suits would be in the manner and on the principles prayed for by said association therein; and is without knowledge whether said litigation has annoyed or harassed the defendants therein, or caused them an expense of more than a quarter of a million dollars; and denies that any rights of the defendants therein are wholly dependent upon and included within the authority of Colorado; and denies that such defendants are entitled to any rights or claims to the use of water of the Arkan-

sas river and its tributaries in Colorado under the adjudication in *Kansas v. Colorado*, as against residents and citizens of Kansas claiming the right to take water for the purpose of irrigation from the Arkansas river in Kansas. This defendant denies that any right of Colorado in respect to the use of water of the Arkansas river are threatened to be adjudicated and determined in said suits without recourse to this court; and denies that this court is the only tribunal empowered to determine the issues in said cases. This defendant denies that Colorado has sovereignity with regard to the use of water of the Arkansas river and its tributaries in Colorado; and alleges that any rights and powers of Colorado to pass upon the appropriation and use of such water are subject to the rights and powers of the state of Kansas and the rights of the citizens and residents of Kansas to appropriate and use for irrigation and other purposes water from the Arkansas river. This defendant denies that the defendants in said two suits in the United States District Court for Colorado have exhausted their remedies and denies that said suits are a state-wide calamity, or affect the prosperity or development of the cities, towns and agricultural districts in Colorado.

NINETEENTH.

This defendant admits the allegations of the nineteenth paragraph of the bill of complaint not herein denied, but does not admit the conclusions of law and legal argument therein contained.

This defendant denies that the ultimate prayer, object, and, if successful, the effect of the prosecution of said two suits by the Finney County Water Users' Association in the United States District Court for Colorado, will be to cause either, any part of, or all, of the following described conditions:

This defendant denies that such prosecution would allow the said District Court to assume jurisdiction between states, and of

political matters, or to adjudicate on the policies and sovereign rights of Colorado, or in effect, to entertain a suit against it contrary to the Eleventh Amendment.

This defendant denies that the same would impose on Colorado a perpetual servitude on behalf of Kansas and its citizens, or impose such a servitude upon the territory of Colorado.

This defendant denies that it would remove from Colorado any public ownership, control and administration of the diversions of water from the Arkansas river in Colorado; or, in disregard and indifference to her constitution and laws or in defiance of her rights as a sovereign state, will lead to said District Court taking over the administration of diversions of water from the said river and its tributaries, or destroy local government and local administrative units.

This defendant denies that it would be in violation of the decision in the case of *Kansas v. Colorado*.

This defendant denies that it would enjoin and overturn any rights of parties in Colorado; and denies that any such rights were adjudicated upon in the case of *Kansas v. Colorado;* or that it would ignore, set aside or destroy any benefits of the people of Colorado by virtue of the decision in the case of *Kansas v. Colorado*.

This defendant denies that it would require the water administration officers of Colorado to refuse recognition to any orders or decrees in said two cases in the District Court; and denies that any such order or decree would be destructive of the Colorado system of water administration, or that Colorado would thereby be required to abandon its system of water distribution.

This defendant denies that it would establish an interstate government unknown to the Constitution, and denies that the water from the Arkansas river and its tributaries in Colorado should be administered as a whole by Colorado.

This defendant denies that it would impose upon Colorado any body of federal officers, and that any such body would usurp the functions of state water administration officers; and denies that it would dislocate the system of water administration in Colorado, or would cause any waste of water, lack of proper supervision of water conservation, or any public disorder or any injury to the sovereignty or jurisdiction of Colorado.

This defendant denies that it would throw upon individual appropriators of water in Colorado the burden of defending the claims of the whole state, or that it would impoverish such appropriators.

This defendant denies that it would embarrass, hamper and render nugatory any right and duty of Colorado and Kansas to settle by compact any controversies concerning the use of said water, pursuant to article 1, section 10, clause 3, of the Constitution of the United States.

This defendant denies that it would confirm in the United States District Court for Colorado any jurisdiction to determine in a suit to which the state is not a party any rights of Colorado pertaining to its alleged sovereignty.

This defendant denies that it would confuse and intermingle the respective jurisdictions of the state and federal governments, or the judicial and executive branches of both governments, and that it would impair or destroy the orderly evolution of agriculture, industry and human population in the Arkansas valley.

This defendant alleges that the effect of such two suits, if decided in favor of the Finney County Water Users' Association, would be to enjoin the action of the defendants therein from taking from the Arkansas river and its tributaries in Colorado water to which the said association has the prior right of appropriation.

This defendant denies that Kansas and Colorado have wholly different laws with reference to water and water systems; but ad-

mits that there are differences in such laws; and alleges that under the laws of Kansas the Finney County Water Users' Association has the right to appropriate and take water from the Arkansas river in Kansas for the purpose of irrigation of agricultural lands and incidental purposes.

TWENTIETH.

Answering the twentieth paragraph of the bill of complaint, this defendant denies that no other court but this court has any authority or jurisdiction to adjudicate upon the relative rights of residents and citizens in Kansas to take water for irrigation from the Arkansas river, and of residents and citizens in Colorado to take water from the Arkansas river and its tributaries.

TWENTY-FIRST.

Answering the twenty-first paragraph of the bill of complaint, this defendant denies that Colorado has no adequate remedy at law, or any remedy at law, or any remedy in any court whatsoever except this court, in respect to the matters set forth in the bill of complaint.

TWENTY-SECOND.

Further answering and for the purpose of obtaining affirmative relief, this defendant alleges:

(a) That the course of the Arkansas river across the state of Kansas, measured along the river, is about 370 miles. Said river in its natural condition carried a large volume of water during the greater part of each year in its course in Colorado and in Kansas. In the state of Kansas the valley of said river is a nearly level plain but a few feet above the natural level of the river. Said valley varies from about two to about twenty-five miles in width, and is bounded on each side by higher ground, and the soil in said valley is rich, and with a sufficient supply of water produces an abundant

yield of agricultural crops and grass. Beginning with the western line of Kansas, said river flows through the following counties in said state: Hamilton, Kearny, Finney, Gray, Ford, Kiowa, Edwards, Pawnee, Barton, Rice, Reno, Sedgwick, Sumner and Cowley. At the western boundary of Kansas the average annual rainfall in the valley of said river is about sixteen inches, and such average increases gradually along the course of said river to the point where it crosses the south line of Kansas and enters Oklahoma. For about 190 miles along the course of said river, easterly from the western line of Kansas, the average annual rainfall has been usually not sufficient to raise crops without irrigation, and the source of water for irrigation of the valley of said river in that portion of its course is the water which naturally flowed in said river. The soil in said valley in Kansas has a large ingredient of sand and is usually of a porous character, is underlaid with coarse sand and gravel, so that water will percolate readily through the soil from the river. With the natural flow of water in said river, the water percolated from said river through the soil on each side throughout the entire width of the valley so that there was a water table beneath the surface of the soil, which came up to a few feet below the surface, and which aided by furnishing moisture in the production of grass and crops upon the land, and furnished a supply of water by means of wells for domestic, municipal, agricultural and other uses.

(*b*) The state of Kansas has owned since the year 1889 a tract of land in said valley in Ford county, Kansas, and adjoining said river, which it has used and does use for the maintenance of a Soldiers Home thereupon. Said tract of land originally contained about 125 acres, but has been added to, until at the time of the filing of the bill of complaint in this case, it contained about 640 acres. Since the year 1885, the state of Kansas owned a tract of land in said valley near said river in Reno county, upon which it has main-

tained and does maintain a large Industrial Reformatory, and it has used for many years and does use much of said land for farming purposes in connection with said Reformatory. Said tract of land originally contained about 640 acres, but has been added to until at the time of the filing of the bill of complaint in this case it contained about 1,290 acres.

(c) Said valley in Kansas is, outside of the towns, and has been for many years past, settled and occupied by farmers and raisers and feeders of live stock. The population gradually diminishes in density from the east towards the west. The state of Kansas has received a large revenue by means of taxation upon the lands in said valley, but the amount of said revenue gradually diminishes from the east towards the west, and is affected by the water supply of the land in said valley, either by percolation from water flowing in the Arkansas river, or by irrigation directly from such water; and the greater such water supply, the greater the assessment valuation of such lands for taxation and the revenue derived by the state therefrom; and the less such water supply, the less such assessment valuation and revenue. Many cities, towns and villages, organized as municipal corporations under the laws of Kansas, are situate in said valley in Kansas, and many adjoining said river; and said municipalities require for their uses and the uses of their residents, supplies of water, and the source of such supplies is either water flowing in said river in its natural condition, or the water percolating through the soil of said valley from said river; and the diminution of such water supply diminishes the amount of water available by such municipalities for their uses and the uses of their residents.

(d) Irrigation of lands in the Arkansas valley in western Kansas by water drawn from the flow in said river was begun as early as the year 1879, and has continued to the time of the filing of the bill

of complaint in this case. Beginning in the year 1879, such irrigation developed rapidly and continuously, so that by the year 1893 there were many ditches which were used to irrigate lands in said valley in western Kansas, and which were supplied by water from said river; and a large acreage of land was irrigated for farming purposes by means of such ditches and such supply of water. Such irrigation resulted in the raising of large and valuable agricultural crops upon the land so irrigated, and there were many residents and citizens of Kansas engaged in farming, by means of irrigation, such lands so irrigated. After 1893 some additional ditches were constructed in said valley in western Kansas for the purpose of irrigating lands by means of water from said river; and a large amount of farming was conducted by means of water furnished by said additional ditches; and many residents and citizens of Kansas were engaged in farming lands by means of irrigation from said ditches, and large and valuable crops were raised upon said lands.

(e) At the time of the filing of the bill of complaint in this case the following irrigation ditches were in existence in said valley in western Kansas, and supplied, when it was available, water for agricultural irrigation from the Arkansas river of lands in Kansas. The intakes of said ditches on said river were in Kansas, excepting that of the Frontier Ditch. Such ditches, with the location by counties, and the dates when the construction was begun, and when they appropriated and began the beneficial use of water for irrigation from the Arkansas river, are set out as follows:

The Frontier Ditch, in Hamilton county; the ditch begun and water appropriated in the year 1892. The intake of this ditch is in Colorado, about one mile and a half from the Kansas line.

The Alamo Ditch, in Hamilton county; ditch begun and water appropriated in 1883.

The Fort Aubrey Ditch, in Hamilton and Kearny counties; ditch begun and water appropriated in 1882.

The Amazon Ditch in Kearny county and Finney county; ditch begun and water appropriated in 1887.

The South Side Ditch, in Kearny county and Finney county; ditch begun and water appropriated in 1880.

The Great Eastern Ditch, in Kearny county and Finney county; ditch begun and water appropriated in 1881.

The Finney County Water Users' Association Ditch in Kearny county and Finney county; ditch begun and water appropriated in 1880.

The Garden City Ditch in Finney county; ditch begun and water appropriated in 1879.

And also, the Eureka Ditch, which was begun and which began the beneficial use of water for irrigation for agricultural purposes, but was not in actual use for irrigation at the time of the filing of the bill of complaint in this suit, owing to the scarcity of water in the Arkansas river caused by the increased taking of water from such river and its tributaries in Colorado for the purpose of irrigation in that state, but had been in such use for many years, and has not been abandoned; situated in Gray county and Ford county.

Besides, there have been several other ditches for which water was appropriated from the Arkansas river and beneficially used for irrigation for agricultural purposes, and which were built in the said valley in western Kansas many years prior to the filing of the bill of complaint in this suit, but which had not been used for the purposes of irrigation for a number of years prior to such time owing to the scarcity of water in the Arkansas river caused by the increased taking of water in such river and its tributaries in Colorado for the purpose of irrigation in that state. Among such ditches were: One, located in Hamilton county, the intake of which was

located in Colorado about two miles and a half west of the Kansas line, and which was built and the water appropriated therefor from said river in 1884, and which has been known as "Taylor's South Side Ditch"; and another ditch on the south side of the said river in Hamilton county, which has been known as the "West Kansas Flood Ditch," which was built and the water therefor appropriated in the year 1908; and two ditches in Ford county, one on the south side, and the other on the north side of said river.

The said ditches, which were in operation at the time of the filing of the bill of complaint in this case, were irrigating, when water was available therefor from the Arkansas river, over 70,000 acres of land in Kansas for the purpose of raising agricultural crops; and the said Eureka Ditch was capable of irrigating, if water were available from the Arkansas river, many thousands of acres of land for the purpose of raising agricultural crops; and the other ditches, which were not in use at the time of the filing of the bill of complaint in this case, were capable of irrigating, if water were available from the Arkansas river, many thousands of acres of land for the purpose of raising agricultural crops. At the time of the filing of the bill of complaint in this case, farming was actually conducted upon land served by those of said ditches which were then in operation to the extent of about 70,000 acres for the purpose of raising agricultural crops; but on account of the increased taking of water from the Arkansas river and its tributaries in Colorado for the purpose of irrigation, said farming operations, under said ditches in Kansas, were, and had been for a number of years, conducted with difficulty; and the supply of water for irrigation furnished by said ditches from the Arkansas river was, and had been for a number of years, inadequate for the purpose of successfully raising agricultural crops upon said land.

(f) Owing to the continual and greatly increased taking of water from the Arkansas river and its tributaries in Colorado for the purposes of irrigation in that state, from about the year 1880 to the time of the filing of the bill of complaint in this case, the most of the ordinary flow of water in said river from Colorado into Kansas has been consumed in Colorado, and, for a number of years prior to the filing of the bill of complaint in this case, most of the water flowing by said river from Colorado into Kansas has been from extraordinary rains on the plains causing floods in the Arkansas river and its tributaries in Colorado, and such supply of water from floods has been of short duration at each time. For a number of years prior to the filing of the bill of complaint in this case, Colorado has been engaged, by means of reservoirs, in impounding portions of the flood water in said river and its tributaries in Colorado in order to serve irrigation ditches in Colorado. Owing to such increased taking of water from said river and its tributaries in Colorado, which has been by the aid and permission and under the purported authority of Colorado, the area of lands irrigated by such ditches in Kansas has been greatly diminished and the amount and value of the crops raised upon such land has been greatly decreased, the citizens and residents of Kansas farming such lands have suffered injury and damage, and it has thereby been made difficult, and from time to time impossible, for them to raise crops upon their said lands. There are large areas of lands lying under said ditches in Kansas which could have been irrigated from said ditches if water had been available therefor from the Arkansas river, and large and valuable crops could have been raised upon such lands; but which have not been irrigated and upon which crops have not been raised, for the reason of the lack of water from said ditches, which lack of water has been caused by the increased taking of water in Colorado herein referred to.

(g) The times of the beginning of construction of said ditches in Kansas, and of the appropriation of waters therefor from the Arkansas river were prior to the times of the beginning of construction of the ditches in Colorado and the purported appropriation of waters therefor from the Arkansas river and its tributaries in Colorado as to most of such ditches, and as to the greater part of the amount of the appropriation of waters for such ditches in Colorado. The parties owning or managing most of said irrigation ditches in Colorado have been, by the permission and aid of Colorado and with its purported authority, for many years prior to the filing of the bill of complaint in this case, taking water from the Arkansas river and its tributaries in Colorado, for the purposes of irrigation in that state, and have thereby deprived of the use of such water residents and citizens of Kansas who had appropriated and put to beneficial use for irrigation for agricultural purposes in Kansas water flowing in said river prior in time to the appropriation of water from the Arkansas river and its tributaries in Colorado for irrigation for agricultural purposes in that state by said parties in Colorado, and which water said residents and citizens of Kansas had the prior right to take and use and for irrigation in Kansas.

(h) On May 20, 1901, the state of Kansas, by leave of this court, filed its bill in equity in this court against the state of Colorado as defendant, seeking to enjoin the taking of water by Colorado, or its residents or citizens, under the permission and aid and with the purported authority of Colorado, to an extent that, as alleged in said bill, deprived Kansas, its municipalities located in said valley in Kansas, and residents and citizens who resided and held or owned lands in said valley in Kansas, of the uses and benefits of the water of said river as it had flowed naturally from Colorado into and through Kansas in said river. Colorado, having been served with

process, entered its appearance in said case. A demurrer to the bill was filed by Colorado, and such demurrer was overruled. The opinion on such ruling is reported in 185 United States Reports, at page 125, 46 L. Ed. 838. Such opinion was rendered April 7, 1902. Thereafter the bill of complaint of Kansas was amended and some additional allegations were made, and wrongful acts were charged against additional defendants who were residents or citizens of Colorado, in the taking of water from the Arkansas river and its tributaries in Colorado to such an extent as to deprive Kansas, its municipalities and its residents and citizens, owning or holding lands situate in the valley of the Arkansas river in Kansas, of the natural flow of the water in said river from Colorado into Kansas, and through Kansas. Issues of fact having been made by answers in said case, evidence was taken by the parties, and the taking of evidence was concluded on June 16, 1905. Said case was heard by this court upon the evidence and upon questions of law. The final decision was rendered May 13, 1907, and the opinion is reported in 206 United States Reports, at page 46, 51 L. Ed. 956. The issues and decisions in that case did not pertain to any questions of priority in the rights of appropriation of water as between residents or citizens of Kansas and residents or citizens of Colorado, but related only to the claims of Kansas to have the water allowed to flow by said river from Colorado into Kansas as it had naturally flowed. The bill of complaint in that case was dismissed without prejudice to any future suit by the state of Kansas pertaining to the flow of water in the Arkansas river from Colorado into Kansas.

(*i*) The issues in this pending case include questions as to the rights of individual appropriators and users of water for the purposes of irrigation in Kansas and in Colorado respectively, and, also, the question of the increased taking of water from the Arkansas river and its tributaries in Colorado by Colorado, or residents and

citizens of Colorado, by its aid, permission and under its purported authority to an extent greater than the taking of water from such river and its tributaries in Colorado at or prior to May 20, 1901, the time of the filing of the bill of complaint in the case of *Kansas v. Colorado*, all to the injury and damage of Kansas, its residents and citizens.

(*j*) This defendant alleges that since May 20, 1901, the date on which the bill of complaint was filed in the case of *Kansas v. Colorado*, the state of Colorado and its residents and citizens, by its aid, permission and with its purported authority, have from time to time and from year to year greatly increased the taking of water from the Arkansas river and its tributaries in Colorado for the purpose of irrigating lands in that state, and have greatly increased the area of lands thereby irrigated, and they have also, for the purpose of irrigation, greatly extended, widened and deepened prior ditches, and have built many new and extensive ditches, and have built many new large reservoirs and enlarged old reservoirs for the purpose of storage of water taken from the said river and its tributaries in Colorado for the purpose of irrigation in that state. During said period the state of Colorado, its residents and citizens, with its aid, permission and purported authority, have built reservoirs in Colorado of large storage capacity for the purpose of irrigation in that state, and have stored water taken from the Arkansas river and its tributaries in Colorado, and the amount of water taken from the river and its tributaries in Colorado and stored in reservoirs in that state for the purpose of irrigation and used for irrigation has been greatly increased. The water taken from said river and its tributaries in Colorado as aforesaid and the water stored in said reservoirs as aforesaid has been and is continuing to be used in Colorado for the purpose of irrigation to raise agricultural crops.

As the result of said conduct by Colorado and its residents and

citizens, by its aid, permission and purported authority, the flow of water of the Arkansas river from Colorado into Kansas and across the state of Kansas has been in said period greatly diminished, and the supply of water available for irrigation in Kansas from the Arkansas river has been greatly decreased; and it has been made difficult and sometimes impracticable for farmers served by said irrigation ditches in Kansas to raise crops, and the amount of crops raised by them has been greatly decreased.

Municipalities located in the Arkansas valley in western Kansas, and individuals residing in said valley in western Kansas have obtained, and do obtain, their water supply for municipal purposes and for domestic purposes respectively, and such individuals obtain, and have obtained, their supply of water for live stock, from wells sunk or driven in said valley. As a result of such increased taking of water from the Arkansas river and its tributaries in Colorado, the level of underground water in the valley of the Arkansas river in western Kansas has been substantially lowered, and it has been made more difficult and expensive to obtain water by pumping from the wells referred to for the uses of said municipalities, and the uses of the people residing therein, and the individuals aforesaid.

(k) This defendant alleges that the defendant, the Finney County Water Users' Association, is a corporation organized and existing under the laws of Kansas, with authority, among other things, to take and store water from the Arkansas river, and to use and sell the same for irrigation of lands for agricultural purposes; and that said association owns, maintains and operates an intake to procure water for such purposes from said river, which intake is situate in the eastern part of Kearny county, Kansas, and near the western boundary of Finney county, Kansas; and that said association owns, maintains and operates ditches in Kearny county and in Finney county, Kansas, for the purpose of the conveyance of such

water and the delivery of the same to irrigate lands for agricultural purposes, which water it sells to the owners or occupants of lands for such irrigation. Such ditches and lands are situate in the valley of said river in said counties. This defendant alleges that said association began the construction of said intake, and began the construction of its said ditches, and appropriated said water for said purposes, in the year 1880, and that its right of said appropriation of water is to the extent of 250 cubic feet of water per second, and sufficient to irrigate lands for agricultural purposes, if the water were available, to the extent of about 20,000 acres of land. Said right of appropriation of water, and said intake and ditches were first owned by the Kansas Irrigation, Water Power & Manufacturing Company, a corporation organized and existing under the laws of Kansas and with powers similar to those of said association, and such rights and interests passed through intermediate parties and were conveyed, transferred and assigned to and became vested in the said association. Said right of appropriation of water from the Arkansas river, so vested in said association for said purposes, was begun and took effect prior to the initiation or the taking effect of any claims or asserted rights of appropriation of water by residents or citizens of Colorado from the Arkansas river or its tributaries in Colorado, who are hereinafter named, and who are defendants in the said two suits which were brought by said association in the United States District Court for Colorado, and which two suits have been heretofore in this answer referred to. Said residents and citizens of Colorado, defendants in the first of said two suits, are named as follows:

The Graham Ditch Company; The Fort Bent Ditch Company; The Fort Lyon Canal Company; The Oxford Farmers Ditch Company; The Rocky Ford Canal, Reservoir, Land Loan and Trust Company; The Rocky Ford Ditch Company; The X. Y. Irrigation

Ditch Company; The Bessemer Irrigating Ditch Company; The Holbrook Irrigation District; The Otero Irrigation District; The Arkansas Valley Sugar Beet and Irrigated Land Company; The Lamar Canal and Irrigation Company; The Reorganized Catlin Consolidated Canal Company; The Manvel Canal and Irrigation Company; and the Twin Lakes Reservoir and Canal Company. Each of said companies is a corporation.

Said residents and citizens of Colorado, defendants in the second of said two suits, are named as follows:

The Coler Ditch and Reservoir Company, a corporation; Bruce Tirey; The Nepesta Ditch & Reservoir Company, a corporation; Jas. G. Hamilton; The Town of La Veta, Colo.; Charles L. Martin; Henry R. Carson; W. H. Freeland; Samuel Fielden; Wm. R. Owens; A. M. Tujillo; Pedro A. Sanchez; Epefanio Trujillo and Antonio Trujillo; Fred J. Walsen; Samuel J. Capps and Harry J. Capps, and W. C. H. Capps; Alexander Levy; Juan D. Montez; Albert E. Parks; Evelyn E. Atchison and Demster H. Bailey; Jose Filomeno Cardenas; Joe Brunelli and Chas. Brunelli; Harry G. Hamilton; Blanche Hamilton; Samuel Halloway; The Cucharas Irrigation Company, a corporation; The Town of Walsenburg, Colo., a municipal corporation; R. H. Owens; Orson E. Clark; Juan N. Salas; Castulo Gallego; Marina Cruz; Lucy Potyralski; Wm. B. Martin; Thos. J. Quillian; The Orlando Canal Reservoir Company, a corporation; Faustin Baca; Jeff B. Farr; Placida Cortez; Medardo Espinosa; The Butte-Mesa Reservoir and Land Company, a corporation; Wm. Speed; Pedro A. Gomez; Thos. J. Martin; Antonio D. Valdez; Alvi S. McIntyre; James S. Shearer; Henry Parsons; Susana J. Martinez; Walter N. Houser and Percy Houser; Jacob E. Marker; The Welton Land & Water Company, a corporation; George Zember and Zuzu Zember; M. Perrino; Peter Hansen and Peter Verlift; John R. Owens; Doloritas M. Valdez; E. C. Wright; Eliza A. Brink;

Edward Miller; Malley Ball; The Huerfano Valley Ditch & Reservoir Company, a corporation; J. O. Nelson (Red Top Ditch & Reservoir Company); A. P. Sickman; Carlos E. Romero; Karl Speilman; Annie Wilson; T. J. Thorn; Jesse A. Roche; Emil Schmidt; A. P. Samples; Edwin P. Smith; Bruce Smith; Juan Portue; John Meyer; George Beardsley; Elsworth Bartlett; Abundo Bustos; Teyes Casias; The Swink Ditch & Reservoir Company, a corporation; Highland Irrigation District, a corporation; Frank and Cornelia Mallet; John T. Case; D. N. Case; J. D. Case; John Bumgartner; A. R. Wait; The Holbrook Irrigation District, a corporation; Arkansas Valley Sugar Beet & Irrigated Land Company, a corporation; The Box Springs Canal & Reservoir Company, a corporation; The Bob Creek Reservoir Company, a corporation; The Lewis Canal & Reservoir Company, a corporation; Boon Best; The Hardesty Reservoir, Canal and Land Company, a corporation; The Prairie Land and Irrigation Company, a corporation; John H. Cowden; The Vank Skike Ditch & Reservoir Company, a corporation; The Timpas Creek Reservoir, Ditch and Land Company, a corporation; The Red Top Reservoir, Canal and Land Company, a corporation; Reubin A. Sawyer; Edward E. Sirris; Thomas B. Downey; B. B. Hosler; Edward Lee; The Ordway Ditch and Reservoir Company, a corporation; The Lolita Land, Town and Irrigation Company, a corporation; Crume Epler; James W. Garrett; George Lewis; The Consolidated Extension Canal Company, a corporation; Fred A. Crooks; W. T. Reese; John J. Drinkard; The Cow Butte Land & Irrigation Company, a corporation; George McDermott; Frank McDermott; The Apishapa Consolidated Irrigation Company, a corporation; Arthur W. Millikin; O. D. Hollenbeck; J. M. Garlow; The Colorado Fuel and Iron Company, a corporation; The John Flood Ditch Company, a corporation; Elmer Quick; The City of Trinidad, Colorado; The Mutual Cary Irrigation Company, a cor-

poration; Gus Jeannin; The Model Land & Irrigation Company, a corporation; J. W. Hoback; John Arnett; Samuel T. Brown; E. Von Bruddenbrock; Phily Schneider; Hugh Linder; August Haurin; Emiliano Cutierrez; W. G. Rupp; Charles M. Watkins; A. P. Callahan; The Fountain Mutual Irrigation Company, a corporation; The Lincoln Park Ditch & Reservoir Company, a corporation; Valley Investment Company, a corporation; The Teller Land & Irrigation Company, a corporation.

This defendant alleges that each of said defendants in said two suits in the United States District Court for Colorado, for a number of years past, including prior to the year 1916, and with the aid, permission and with the purported authority of Colorado, has taken water from the Arkansas river and its tributaries in Colorado, and used the same for the purpose of irrigation of land for agricultural purposes in Colorado, most of which water, if it had not been so taken, would have flowed by the channel of the Arkansas river from Colorado into Kansas and to the point where the intake of said association is located in Kearny county, Kansas, and would have been available for irrigation by means of the ditches of said association of lands for agricultural purposes in Kearny county and in Finney county, Kansas. The effect of such taking of water from the Arkansas river and its tributaries in Colorado by said parties in Colorado has been to greatly diminish the flow of water from Colorado into Kansas by the channel of said river to the location of said intake of said association, and to greatly diminish the supply of water which would have otherwise flowed into the ditches of said association through said intake. This defendant alleges that such taking of water by said parties in Colorado has been greatly increased from time to time and from year to year for a number of years past, from the year 1880 down until the time of the filing of the bill of complaint in this suit on January 3, 1928; and the said

taking of water by the said parties in Colorado has resulted in a great and constant depletion of the supply of water which would otherwise have been taken and sold by said association for the purpose of irrigation of lands in the valley of said river in Kearny and in Finney counties, Kansas, and has caused the supply of such water for the purpose of the irrigation of such lands to be so reduced that it is, and for many years past has been, difficult and oftentimes impracticable for said association to obtain or furnish a sufficient amount of water for the irrigation of lands in said valley lying under the grade of its ditches, and has caused the abandonment for agricultural purposes of many thousands of acres of land lying under said ditches, and has caused many partial and many total failures of crops upon the lands lying under said ditches, which have been occupied or owned by residents or citizens in Kansas, and has caused a great financial loss to said association and to said residents and citizens of Kansas.

This defendant alleges that the rainfall in Kearny county and Finney county is not and has not been sufficient to grow crops without the aid of irrigation, and that the average annual rainfall in Finney county is and for many years past has been 19.51 inches, and a little less in Kearny county. This defendant alleges that if it were not for such taking of water by said parties in Colorado from the Arkansas river and its tributaries in that state, the supply of water flowing in the Arkansas river at the intake of said association in Kearny county, Kansas, would have been and would be sufficient to furnish water for irrigation to the lands lying under the grade of the ditches of said association.

(*l*) The residents and citizens of Colorado who have been taking water for irrigation of lands in Colorado from the Arkansas river and its tributaries in Colorado threaten to continue to take such water to the extent hereinbefore described, and the state of Colorado

threatens to aid and permit the same; and said conduct will continue unless enjoined by this court.

Said residents and citizens of Colorado threaten to and will, unless enjoined by this court, increase the taking of water from the Arkansas river and its tributaries in Colorado for irrigation of lands in that state, and the state of Colorado threatens to aid and permit the same; and such conduct, unless enjoined by this court, will continue until there will be no water available in said river in western Kansas to furnish water for irrigation to lands in said valley by means of any of the irrigating ditches there situate.

All of said conduct of said residents and citizens of Colorado and the state of Colorado have been, are, and will be to the great injury and damage of the residents and citizens of Kansas owning or operating irrigation ditches in said valley in western Kansas and to the owners and occupants of lands in said valley which have been served or can be served by said ditches if water from said river were available.

(*m*) This defendant alleges that it has no adequate remedy at law, or any remedy at law, or any remedy in any court whatsoever except in this court, in respect to the matters herein set forth.

WHEREFORE, this defendant, the state of Kansas, prays that each of the said parties in Colorado named in the preceding numbered paragraph, defendants in said two suits pending in the United States District Court for Colorado, brought by the Finney County Water Users' Association, should be required by order of this court in the alternative, either to file a written statement in this case to the effect that the state of Colorado represents each of them respectively in all of the issues of this case the same as if they were parties herein, and that they will be bound by any orders or decrees of this court in this case the same as if they were parties herein; or else that the said parties in Colorado be made parties defendant to this

suit, and in such contingency that this court issue subpœnas or other proper process to each of such parties, summoning each of them to appear herein and present their answers, if any, to the claims for affirmative relief of the state of Kansas hereinbefore set forth, and to abide by the determination of this court; and this defendant further prays that this court will protect and quiet the rights of the state of Kansas, its citizens and residents under the adjudication in *Kansas v. Colorado;* that it will protect and quiet the rights of citizens and residents of Kansas to their appropriation of water in the Arkansas river for irrigation of lands in Kansas as against the acts of parties in Colorado who have later rights or no rights to take water from the Arkansas river or its tributaries in Colorado for the purpose of irrigation; and that it will protect and quiet the rights of the defendant, the Finney County Water Users' Association, to the taking or appropriating of water from the Arkansas river in Kearny county, Kansas, for agricultural irrigation, as against the state of Colorado, and as against the parties in Colorado named in the preceding numbered paragraph; that the rights of residents or citizens of Kansas to divert water from the Arkansas river for the purpose of agricultural irrigation of lands in Kansas be decreed in second feet; that the state of Colorado, and its officers, agents and employees, and all residents or citizens of Colorado, who shall be parties to this suit, be perpetually enjoined from diverting any water from the Arkansas river or its tributaries in Colorado until the rights of said citizens or residents of Kansas to divert water from the Arkansas river shall be satisfied; that the state of Colorado and its officers, agents and employees, and all residents or citizens of Colorado, who shall be parties to this suit, be perpetually enjoined from diverting water from the Arkansas river or its tributaries in Colorado, to the injury of the rights of the state of Kansas,

its residents or citizens; and that this court will make and issue such orders and give such other further and different relief as may be just and equitable.

THE STATE OF KANSAS,

By—

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,

JOHN G. EGAN,
Assistant Attorney-general of the State of Kansas,

CHESTER I. LONG,
Solicitors for the State of Kansas.

APPENDIX A.

QUOTATIONS FROM AND REFERENCES TO KANSAS STATUTES ON THE SUBJECT OF IRRIGATION.

General Statutes of Kansas, 1868.

CHAPTER 23.

CORPORATIONS.

SEC. 4. Private corporations may be created by the voluntary association of five or more persons, for the purposes and in the manner mentioned in the following sections of this article.

SEC. 5. The purposes for which the private corporations, mentioned in the last section may be formed are: . . . *Thirty-fourth*, The construction and maintenance of canals for the purposes of irrigation or manufacturing purposes. (Pages 191-192 *id.*)

SEC. 89. Every canal corporation, for the purpose of irrigation, shall, in addition to the powers heretofore conferred, have power: *First*, To cause such examination and survey for its proposed canal to be made as may be necessary to the selection of the most advantageous route, and for such purpose, by its officers, agents or servants, to enter upon the lands or waters of any person. *Second*, To take and hold such voluntary grants of real and other property as shall be made to it to aid in the construction and maintenance of its canal, ditches and sluices. *Third*, To lay out a canal, not exceeding fifty feet in width, and to construct the same; and, for the purpose of cutting and embankments, to take as much more land as may be necessary for the proper construction and security of the canal or any of its branch ditches or sluices. *Fourth*, To construct its canal across, along or upon any stream of water. *Fifth*, To furnish water for irrigation at such rates as such organization or corporation may by its by-laws and regulations prescribe. *Sixth*, To borrow such sums of money as may be necessary for completing and finishing or operating their canal, and to issue and dispose of their bonds for any amount so borrowed, and to mortgage their corporate property and franchises to secure the payment of any debt

contracted by the corporation for the purposes aforesaid; *Provided*, That damages for any property appropriated by such corporation shall be assessed and paid for as is provided for in case of railroads. (Pages 214-215 *id.*)

Session Laws of Kansas, 1876.

CHAPTER 58.

CORPORATIONS—IRRIGATING OR HYDRAULIC.

AN ACT amendatory of chapter sixty-four of the Laws of 1871, and supplemental to article nine, chapter twenty-three, of the General Statutes of 1868.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. That section eighty-eight of an act concerning private corporations, passed and approved February twenty-ninth, eighteen hundred and sixty-eight, as amended by chapter sixty-four of the Laws of eighteen hundred and seventy-one be further amended so as to read as follows: Section 88. Lands may be appropriated for the use of a macadam, plank road, telegraph, hydraulic, irrigating corporations in the same manner as is provided in this article for railway corporations, as far as applicable, and any hydraulic or irrigating corporation desiring to conduct water in pipes, canals or raceways, or transmit power by shafting, belting and pulleys, or ropes and pulleys, may obtain the right of way for such pipes, canals, raceways, shafting, belting and pulleys, and ropes and pulleys, in manner as aforesaid; and such pipes, canals, raceways, shafting, belting and pulleys, or ropes and pulleys, may be laid through or over any lands or lots, or along or upon any stream of water, using so much of the water thereof as may be needed for the purposes for which the corporation was organized, or through any street or alley or public ground of any city of the second or third class: *Provided*, That no such canal shall be located through any street or alley or any public ground of any city without the consent of the municipal authorities thereof: *Provided further*, That it shall be unlawful for any corporation or person to locate or construct any irrigating canal along or upon any stream of water, or take and use the waters of any stream in such manner as to interfere with or in any wise hinder, delay or injure any milling or irrigating improvements already constructed or located along or upon any stream of water, or to

diminish the supply of water flowing to or through any established irrigating canal.

SEC. 2. That any hydraulic or irrigating company, organized under the laws of this state, may furnish, sell or lease, for such time as it may determine, any portion of its water or power to any person who may wish to use the same, and may convey water in pipes or canal, and may transmit power by shafting, belting and pulleys, or ropes and pulleys, and may borrow such sums of money as may be necesary for completing and finishing or operating its canals, pipes, dams, mills, or machinery, and may issue and dispose of its bonds for any amount so borrowed, and may mortgage its corporate property and franchises, or any part of the same, to secure the payment of any debts contracted by the corporation for the purposes aforesaid.

SEC. 3. The original section one, chapter sixty-four of the Laws of eighteen hundred and seventy-one, is hereby repealed.

SEC. 4. This act shall take effect and be in force from and after its publication in the *Kansas Farmer*.

Approved March 4, 1876. (Pages 153, 154 *id.*)

Session Laws of Kansas, 1885.

CHAPTER 133.

LIENS OF IRRIGATORS.

AN ACT relating to the liens of irrigators.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. Any person, association or corporation which shall, under contract with the owner of a tract or piece of land, his agent, trustee, or under contract with the husband or wife of such owner, furnish water for irrigating any portion of said tract of land, shall have a lien upon the whole crop grown upon said tract or parcel of land during the year the water is so furnished, for the full amount of the contract price.

Approved March 7, 1885. (Pages 205, 206 *id.*)

Session Laws of Kansas, 1885.

CHAPTER 134.

INJURIES TO IRRIGATING CANALS.

AN ACT to provide for the punishment of injuries to irrigating canals.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. Any person who shall willfully or maliciously cut, dig, break down or open any gate, bank embankment, or side of any ditch, canal, flume, feeder or reservoir, the property of another used for the purpose of irrigation, manufacturing, mining, or domestic purposes, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not more than three hundred dollars, and may be imprisoned in the county jail not exceeding ninety days: *Provided*, That this section shall only apply to tracts of lands where said ditch company has secured the "right of way" through the tract of land as cut or opened.

Approved March 7, 1885. (Page 206 *id.*)

Session Laws of Kansas, 1886.

CHAPTER 115.

IRRIGATION.

AN ACT concerning irrigation.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. The right to the use of running water flowing in a river or stream in this state, for the purposes of irrigation, may be acquired by appropriation. As between appropriators, the one first in time is the first in right.

SEC. 2. Any person, company or corporation entitled to the use of water may change the place of diversion, if others are not injured by such change, and may extend the canal, ditch, flume or aqueduct by which the diversion is made to places beyond that to where the first use was made.

SEC. 3. Any person, company or corporation desiring hereafter to appropriate water, must post a notice in writing at a conspicuous place at the point of diversion, stating therein: First, That such person, company or corporation claims the water there flowing to the extent of —— (giving the number of) inches, measured under a

four-inch pressure, and describing and defining as accurately as may be the place of diversion; second, the means by which such person, company or corporation intends to divert it, and the size of the canal ditch, or flume, or aqueduct, in which he intends to divert it. A copy of such notice must, within ten days after it is posted at the place of diversion, be also posted in a conspicuous place in the office of the county clerk of the county in which such place of diversion is situated, and be recorded by the county clerk in a book to be kept for that purpose.

SEC. 4. Within sixty days after the notice is posted, the claimant must commence the excavation or construction of the works in which such claimant intends to divert the water, and must prosecute the work diligently and uninterruptedly to completion, unless interrupted by stress of weather. By completion is meant conducting the water to the place of its intended use. By a compliance with the above rules, the claimant's right to the use of the water relates back to the time the notice was posted. A failure to comply with such rules shall deprive the claimant of the right to the use of the water as against a subsequent claimant who complies therewith.

SEC. 5. The county clerk of each county where water is appropriated for the purpose of irrigating lands, shall keep a book in which he shall record the notices provided for in this act, together with verified proof of the posting thereof.

SEC. 6. Where any canal, ditch, flume, or aqueduct, which is the property of any individual, company, or corporation, and is used for the purpose of irrigating lands, has been located or constructed upon or over any tract of land with the knowledge or consent of the owner of such lands, or upon or over any tract of land owned by the United States, and prior to the occupation of the same by any settler for the purpose of entry under any act of congress, such location and construction shall be *prima facie* evidence that the same was rightful; and such canal, ditch, flume or aqueduct shall be deemed and held to come within the provisions and protection of section one of chapter one hundred and thirty-four of the Session Laws of eighteen hundred and eighty-five: *Provided, however*, That such canal, ditch, flume or aqueduct shall have been constructed for a period of at least two years prior to the first day of January, A. D. eighteen hundred and eighty-six.

SEC. 7. Any individual, company or corporation who has heretofore constructed any canal, ditch, flume or aqueduct for purposes

of irrigation upon or over lands unoccupied at the time of such construction, who shall maintain the same for the period of five years succeeding such construction, without objection in writing from the owner of such land, or subsequent claimant under the laws of the United States or of the state of Kansas, shall after the expiration of said period of five years, be deemed and held to have acquired a permanent right of way for such canal, ditch, flume, or aqueduct, not exceeding, however, the total width of three times the width of such canal, ditch, flume, or aqueduct.

SEC. 8. When any individual, company or corporation shall have constructed any canal, ditch, flume or aqueduct, for purposes of irrigation over unoccupied lands of another, the damages awarded for the right of way of such canal, ditch, flume or aqueduct shall not exceed the value of the land occupied at the date of such construction, and neither the enhanced value of the land growing out of the construction of such canal, ditch, flume, or aqueduct, nor the subsequent enhancement of its value through settlement made after the construction of such canal, ditch, flume or aqueduct, shall be considered in estimating the damages for such right of way: *Provided*, Such canal was constructed with the knowledge and without protest from the owner of the land.

SEC. 9. This act shall take effect and be in force from and after its publication in the official state paper.

Approved February 19, 1886. (Pages 154-156 id.)

Session Laws of Kansas, 1891.

CHAPTER 133.

IRRIGATION.

AN ACT providing for and regulating the diversion, appropriation, storage, and distribution of waters for industrial purposes within prescribed limits and of the construction, maintenance and operation of works therefor; prohibiting unlawful use thereof or interference therewith; providing for the creation of irrigation districts having certain powers; fixing penalties for and assigning jurisdiction of offenses hereunder; defining the powers and duties of certain public officers; and for other purposes.

Be it enacted by the Legislature of the State of Kansas:

In the manner following; that is to say:

ARTICLE I.

OF THE DIVERSION AND APPROPRIATION OF WATER FOR INDUSTRIAL USES.

SECTION 1. In all that portion of the state of Kansas situated west of the ninety-ninth meridian, all natural waters, whether standing or running, and whether surface or subterranean, shall be devoted first, to purposes of irrigation in aid of agriculture, subject to ordinary domestic uses, and secondly, to other industrial purposes, and may be diverted from natural beds, basins, or channels, for such purposes and uses: *Provided*, That no such diversion shall interfere with, diminish or divest any prior vested right of appropriation for the same or a higher purpose than that for which such diversion is sought to be made without the due legal condemnation of, and compensation for, the same; and natural lakes and ponds of surface water, having no outlet, shall be deemed parcel of the lands whereon the same may be situate, and only the proprietors of such lands shall be entitled to draw off or appropriate the same.

SEC. 2. The appropriation of water hereafter shall, in every case, be deemed and be taken to be accomplished and effectual only as to so much water as shall have been actually applied to beneficial uses within a reasonable time after the commencement of the works by means of which such appropriation is intended to be made, or afterwards where no appropriation has in the meantime been initiated by others, together with the reasonable amount necessary to supply losses by waste, seepage and evaporation; all the residue of the water within the capacity of the canal or other works shall be deemed to be derelict, and liable to appropriation by any subsequent appropriator.

SEC. 7. Every person complying with the provisions of this act, and applying the waters obtained by means of any artesian well to beneficial uses, shall be deemed to have appropriated such waters to the extent to which the same shall be so applied within a reasonable time after the commencement of the works, and such appropriation shall have effect as of the day of commencement of such works, provided the same is prosecuted with reasonable diligence; otherwise, from the time of the application of the waters thereof to beneficial uses.

SEC. 8. Any prior right of appropriation shall exist and continue only by the exercise thereof in a lawful manner, and any failure of

such appropriator continuously to apply such water to lawful and beneficial uses, without due and sufficient cause shown for such failure, shall be deemed an abandonment and surrender of such right.

SEC. 9. Every vested right of prior appropriation or diversion of water for industrial uses shall be subject as to the right of eminent domain, and may be condemned and compensated for, for public and beneficial uses, in the same manner and under the same restrictions and regulations as govern the condemnation of other private property. (Pages 223-226, *id.*)

This act extends from page 223 to page 260 of the Session Laws of Kansas, 1891. The headings of the articles after the first are as follows:

"Article II, of the right of use of water." There are six sections in this article.

"Article III, of right of way and site for works for appropriation and devoting waters to beneficial uses." There are five sections in this article.

"Article IV, of the construction, maintenance and operation of works for appropriating and devoting waters to beneficial uses." There are 32 sections in this article.

"Article V, of the disposal of seepage waters." There are two sections in this article.

"Article VI." This article vests power in the Board of Railroad Commissioners to fix, upon complaint, reasonable charges for water furnished by an irrigation company to users thereof. There are two sections in this article.

"Article VII, of the creation of irrigation districts having certain powers." There are twenty-four sections in this article.

"Article VIII, of unlawful interference with, injury to, or use of, works appropriating and devoting water to beneficial uses, or the water thereof; and of penalties therefor, and proceedings for the punishment of offenses respecting the same." There are twenty-five sections in this article. (Pages 223-260, *id.*)

Session Laws of Kansas, 1899.

CHAPTER 95.

RELATING TO RIGHT OF WAY AND LEASES OF CERTAIN CORPORATIONS.

Section 1 of this chapter amends section 1 of chapter 85, Laws of Kansas, 1891, the same being sections 1397 and 1398 of General Statutes of 1889. It provides, *inter alia:*

"SEC. 1397. Lands may be appropriated for the use of . . . irrigating . . . corporations . . . in the same manner as is provided in this article for railway corporations, as far as applicable; and any . . . irrigating . . . company . . . desiring the right to dam or take water from any stream, to conduct water in canals or raceways or pipes . . . may obtain such right or the right of way for all necessary canals, raceways, pipes . . . in the manner aforesaid; and such canals, raceways, pipes . . . may be laid, carried or stretched on, through or over any land, or lot, along or upon any stream of water, using so much of the water thereof as may be needed for any of the purposes aforesaid, . . . : *Provided further*, That it shall be unlawful for any person or corporation to locate or construct any irrigating canal or raceway along or upon any stream of water, or take and use the water of any stream in such manner as to interfere with or in anywise hinder, delay or injure any milling or irrigating improvements already constructed or located along or upon any stream or water, or to diminish the supply of water flowing to or through any established irrigating canal."

Section 2 of this chapter 95, Laws of Kansas, 1899, amends section 1398 of the General Statutes of Kansas, 1889, and provides, *inter alia:*

"That any . . . irrigating . . . company . . . may furnish, sell, let or lease, for such time as such corporation may determine, any portion of its water . . . to any person or persons, or corporation or partnership, who may wish to use the same, and may convey water in channels, raceways or pipes." (This chapter appears on pages 191-193, Session Laws of Kansas, 1899.)

The Following Quotations are from the Revised Statutes of Kansas, 1923:

Titles of the headings are given of the sections which are not quoted.

17-202. *Authority to incorporate.* The purposes for which private corporations may be formed are: . . . (Clause 37.) The construction and maintenance of dams and canals for the purpose of waterworks, irrigation, or manufacturing purposes.

42-109. *Condemnation of right to take water.* Any and all irrigating-ditch and canal companies which have been heretofore organized or incorporated, or which may hereafter become organized and incorporated, for the purpose of procuring or furnishing water for the purposes of irrigation, which shall desire to condemn the right to take such water from any stream in the state of Kansas, shall have the right to procure such condemnation for such purpose in the following manner. (L. 1889, ch. 165, p. 1; March 27.)

42-110. *Petition to district court; appointment of commissioners.*

42-111. *Notice by such commissioners.*

42-112. *Assessment of damages.*

42-113. *Report of commissioners.*

42-114. *Time for such report.*

42-115. *Appeals from decision of commissioners.*

42-116. *Trial of such appeal.*

42-117. *Filing of report and payment of damages.*

42-118. *Right to take water condemned.*

42-119. *Lien upon crop for water.*

42-120. *Powers of canal corporations.*

42-121. *Water rights and shares in irrigation companies.*

42-122. *Offenses affecting works.*

42-316. *Right of way and site for works for diverting, storing or conveying water.*

42-317. *Condemnation of lands for site or way.*

42-101. *Right to use of running water.* The right to the use of running water flowing in a river or stream in this state, for the purposes of irrigation, may be acquired by appropriation. As between appropriators, the one first in time is the first in right. (L. 1886, ch. 115, p. 1; Feb. 26.)

42-102. *Change of place of diversion.* Any person, company or corporation entitled to the use of water may change the place of diversion, if others are not injured by such change, and may extend the canal, ditch, flume or aqueduct by which the diversion is made to places beyond that to where the first use was made. (L. 1886, ch. 115, p. 2; Feb. 26.)

42-103. *Notice at point of diversion.* Any person, company or corporation desiring hereafter to appropriate water must post a notice in writing at a conspicuous place at the point of diversion, stating therein: *First*, That such person, company or corporation claims the water there flowing to the extent of —— (giving the number of) cubic feet per second, and describing and defining as accurately as may be the place of diversion; *second*, the means by which such person, company or corporation intends to divert it, and the size of the canal, ditch or flume or aqueduct in which he intends to divert it. A copy of such notice, together with proof of the posting thereof, must, within ten days after it is posted at the place of diversion, be filed in the office of the register of deeds of the county in which such place of diversion is situated, and be recorded by such register of deeds in a book to be kept for that purpose. (Revised, 1923; old sections, L. 1886, ch. 115, p. 3; L. 1891, ch. 133, art. 8, p. 25.)

42-104. *Time within which claimant must commence works for appropriation.* Within six months after the notice is posted, the claimant must commence the excavation or construction of the works in which such claimant intends to divert the water and must prosecute the work diligently and uninterruptedly to completion, unless interrupted by stress of weather or other unavoidable circumstance. By compliance with the above the claimant's right to the use of the water relates back to the time the notice was posted. A failure to comply with the above conditions shall deprive the claimant of the right to use of the water as against the subsequent claimant who complies therewith: *Provided*, That in any case wherein such notice has already been posted and the said sixty days

has not yet expired the party or parties posting said notice, or their grantees or assigns shall have six months from the taking effect of this act within which to commence the excavation or construction of the works as herein provided. (L. 1886, ch. 115, p. 4; L. 1911, ch. 216, p. 1; Jan. 27.)

42-105. *Recordation of notices.* The register of deeds of each county where water is appropriated for the purpose of irrigating lands shall keep a book in which he shall record the notices provided for in this act, together with verified proof of the posting thereof. (Revised, 1923; old section, L. 1886, ch. 115, p. 5.)

42-106. *Works prior to 1884.* Where any canal, ditch, flume or aqueduct which is the property of any individual, company, or corporation, and is used for the purpose of irrigating lands, has been located or constructed on or over any tract of land with the knowledge or consent of the owner of such lands, or upon or over any tract of land owned by the United States, and prior to the occupation of the same by any settler for the purpose of entry under any act of congress, such location and construction shall be *prima facie* evidence that the same was rightful; and such canal, ditch, flume or aqueduct shall be deemed and held to come within the provisions and protection of section one of chapter one hundred and thirty-four of the Session Laws of eighteen hundred and eighty-five: *Provided, however,* That such canal, ditch, flume or aqueduct shall have been constructed for a period of at least two years prior to the first day of January, A. D. eighteen hundred and eighty-six. (L. 1886, ch. 115, p. 6; Feb. 26.)

42-107. *Construction of work on or over unoccupied lands.*

42-108. *Measure of damages for right of way.*

42-301. *Diversion and appropriation of natural waters west of ninety-ninth meridian.* In all that portion of the state of Kansas situated west of the ninety-ninth meridian, all natural waters, whether standing or running, and whether surface or subterranean, shall be devoted, first, to purposes of irrigation in aid of agriculture, subject to ordinary domestic uses; and secondly, to other industrial purposes; and may be diverted from natural beds, basins or channels for such purposes and uses: *Provided,* That no such diversion shall interfere with, diminish or divest any prior vested right or appropriation for the same or a higher purpose than that for which such diversion is sought to be made, without due legal condemnation of

and compensation for the same; and natural lakes and ponds of surface water, having no outlet, shall be deemed parcel of the lands whereon the same may be situate, and only the proprietors of such lands shall be entitled to draw off or appropriate the same. (L. 1891, ch. 133, art. 1, p. 1; May 20.)

42-302. *Extent of appropriation; residue of waters.* The appropriation of water hereafter shall in every case be deemed and be taken to be accomplished and effectual only as to so much water as shall have been actually applied to beneficial uses within a reasonable time after the commencement of the works by means of which such appropriation is intended to be made, or afterwards where no appropriation has in the meantime been initiated by others, together with the reasonable amount necessary to supply losses by waste, seepage and evaporation; all the residue of the water within the capacity of the canal or other works shall be deemed to be derelict, and liable to appropriation by any subsequent appropriator. (L. 1891, ch. 133, art. 1, p. 2; May 20.)

42-303. *Right to conduct water along natural channels and withdraw same.* Any person may conduct water into and along any of the natural streams or channels of the state, and may withdraw all such waters so by him turned into such channel at any point desired, without regard to prior appropriations of water from said stream, due allowance being made for evaporation and seepage. (L. 1891, ch. 133, art. 1, p. 3; May 20.)

42-304. *Change of natural channel so as to prevent inflow into ditch or conduit.*

42-310. *Right to continuance of use of water procured from carrier by contract.*

42-311. *Right to take water for domestic uses.*

42-312. *Such person responsible for injury or pollution.*

42-313. *Right to collect and store water.* Any person entitled to the use of water for the irrigation of lands or other purposes whatsoever may, at any time while so entitled to the use thereof, collect and store the same up for use presently thereafter; and the failure to apply or use such waters during the period of such collection and storage shall not be deemed or taken to impair his right in that behalf. (L. 1891, ch. 133, art. 2, p. 4; May 20.)

42-314. *Abandonment of right to use or enjoyment of water.*

42-315. *Right of use of water subject to eminent domain.*

42-321 to 42-329, inclusive, pertain to the construction, operation and maintenance of irrigation works.

42-329. *Distribution of water at source of supply among proprietors of works.* The waters of the several streams and sources of supply shall be distributed among the several canals, ditches, conduits and other works so that the proprietors of each of said works, and those entitled to water therefrom, shall, as nearly as may be, and to the extent of their needs, at all times receive and enjoy the waters to which they are severally entitled; and whenever it shall appear that there is flowing into any such works, water to which the proprietor of any other such works having a prior right is entitled, and that such other works having priority of right is not receiving the water necessary for the consumers of water therefrom, and which ought to flow to the same, the head gate of such works having the excess, and being subsequent in right, shall be closed or partly closed, so that a sufficient amount of water of such stream or source of supply may pass and flow to the said works having the priority of right, to the amount to which the same shall be entitled; and if the proprietors of any such works having such excess and being subsequent in right shall fail or refuse to turn out such supply of water when requested by the party entitled to receive the same so to do, the head gate or waste gate of the works receiving such excess shall be so set and locked by the officer authorized by law to perform such duty as to permit a sufficient amount of said water to pass and flow to the party having the right to receive the same. (L. 1891, ch. 133, art. 4, p. 9; May 20.)

(Effective December 27, 1923.)

APPENDIX B.

A list of some reservoirs, new except one, to store water from the Arkansas river or its tributaries in Colorado, for irrigation of lands in that state, authorized by the state engineer of Colorado in the period 1909-1912, inclusive.

Reservoir No. 1, in the Holbrook Irrigation District. This was an enlargement of a previously existing reservoir.

Dye Reservoir, on the line of the Lake Canal, in the Holbrook Irrigation District.

Schaeffer Reservoir, on Beaver creek, in the northeastern part of Fremont county.

Marion Reservoir, in the southeastern part of Custer county.

Two Buttes Reservoir, on Two Buttes creek, in Prowers county.

Kit Carson Reservoir, in the Big Sandy Irrigation District, in Cheyenne county.

Adobe Creek Reservoir, in Bent and Kiowa counties, about ten miles north of the town of Las Animas.

Spring Run Reservoir, near Colorado Springs, in El Paso county.

Omer Reservoir, on the Apishapa river, in Otero county.

Camp Vigil Reservoir, on Little Fountain creek, in El Paso county.

Meyer Reservoir, near the headwaters of the Huerfano river, in Huerfano county.

Cucharas Valley Reservoir No. 5, on the Cucharas river, in Huerfano county.

The Antero Reservoir.

Mount Pisgah Reservoir, near the headwaters of Four Mile creek, in Teller county.

Clear Creek Reservoir, near the mouth of Clear creek, which flows into the Arkansas river about three miles below the town of Granite, in Chaffee county.

Bradford Lake Reservoir No. 1, in Huerfano county.

Columbine Reservoir No. 2, in Water District No. 16, in Huerfano county.

Beckwith Reservoir, in Water District No. 15, in Pueblo county.

Northfield Land and Reservoir Company No. 4, in Water District No. 10, in El Paso county.

Bent County Reservoir, in Water District No. 67, in Bent county.

Red Top Reservoir, in Water District No. 17, in Pueblo county.

Mountain View Reservoir No. 1, in Water District No. 12, in Custer county.

Cow Butte Reservoir No. 3, in Water District No. 17, in Crowley county.

APPENDIX C.

Acreage irrigated in Colorado from the Arkansas river and its tributaries as reported in biennial reports of the state engineer of Colorado:

Year.	*Acres.*	*Year.*	*Acres.*
1900	317,015	1914	475,892
1901	346,812	1915	503,011
1902	288,991	1916	464,107
1903	No record	1917	464,391
1904	No record	1918	398,119
1905	338,921	1919	No record
1906	376,734	1920	519,993
1907	439,415	1921	482,677
1908	466,357	1922	521,013
1909	No record	1923	517,721
1910	398,956	1924	532,681
1911	487,367	1925	500,546
1912	478,935	1926	544,876
1913	447,499		

12-6668

Office Supreme Court, U. S.
FILED
APR 8 1929
CHARLES ELMORE CROPLEY
CLERK

FILE COPY

SUPREME COURT OF THE UNITED STATES

No. [redacted] ORIGINAL, OCTOBER TERM, 1928.

THE STATE OF COLORADO, COMPLAINANT,

VS.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

SEPARATE ANSWER OF THE DEFENDANT, THE FINNEY COUNTY WATER USERS' ASSOCIATION.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for The Finney County Water Users' Association, a Corporation.

SUPREME COURT OF THE UNITED STATES

No. 14 ORIGINAL, OCTOBER TERM, 1928.

THE STATE OF COLORADO, COMPLAINANT,

VS.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

SEPARATE ANSWER OF THE DEFENDANT, THE FINNEY COUNTY WATER USERS' ASSOCIATION.

Comes now the defendant The Finney County Water Users Association and by leave of Court files this its separate answer to the Bill of Complaint filed herein by the State of Colorado, and respectfully says:

FIRST.

The defendant admits all of the allegations of the first paragraph of the Bill of Complaint.

SECOND.

The defendant admits all of the allegations of the second paragraph of the Bill of Complaint.

THIRD.

The defendant admits all of the allegations of the third paragraph of the Bill of Complaint except as herein denied or qualified; and the defendant denies:

That the Arkansas River in what is known as the Great Plains flows in a valley almost entirely of shifting sand, the slopes of which are scarcely distinguishable from the flat contours of the open prairie. But on the contrary avers that throughout the Plains country of eastern Colorado and western Kansas the said river has a well defined channel with bank from six to eight feet high; that the riparian land rises gradually in a series of benches called first and second bottom, all of which are alluvial and highly fertile under irrigation; that the general characteristics of said river and its valley, and the country adjoining, and the climatic conditions are practically uniform from the point where the river emerges from the Rocky Mountains to a point about two hundred miles east of the western border of Kansas.

That throughout the course of the Arkansas River as aforesaid, and as far east as the eastern line of Finney County, in the State of Kansas, the country is semi-arid, dry farming is unsuccessful and unprofitable, and irrigation is necessary to successful agriculture. That the rainfall increases very gradually from Pueblo to Dodge City.

The defendant admits that to a considerable extent the country along the Arkansas River and its tributaries in Colorado is dependent upon irrigation for agricultural prosperity, but denies the extent of such

dependence; denies the number of counties affected by the flow of the Arkansas River, and its tributaries; denies that the cities in said paragraph mentioned are wholly dependent for their prosperity on their supply of water from the Arkansas River, or its tributaries, and alleges that throughout the whole course of the Arkansas River in the territory above described there is a vast body of underground water commonly known as the underflow, fed by the melting rains and snows of the Rocky Mountains, and that the cities and towns along the river depend for their water supply for domestic purposes almost altogether upon water drawn by wells from this underflow.

Defendant further alleges that the cities of Trinidad and Pueblo are almost altogether dependent for their prosperity upon mineral resources and industries connected therewith but the defendant admits that from Pueblo eastward throughout the entire valley of the Arkansas River to the eastern line of Finney County, in Kansas, the country is largely dependent upon its agricultural resources, and largely upon irrigation.

Defendant further alleges that the prosperity built up in Colorado upon irrigation has been built up upon the unlawful diversion of the water of the Arkansas River as against the prior and superior right of this defendant as hereinafter described, contrary to law and in derogation, and in defiance of the comity between the States of Kansas and Colorado, and the well settled rules and decisions of this and the lower Federal Courts. That by reason of such unlawful diversion that part of the plains country in Colorado has pro-

gressed in wealth, and the western part of Kansas has correspondingly declined. That since May, 1901, when the case of *Kansas* v. *Colorado* commenced in this Court the citizens of Colorado, with the consent and assistance of the State of Colorado, have steadily and largely increased their diversions from the Arkansas River, and its tributaries; that since that date there have been new appropriations from the flow of the river and its tributaries either for direct irrigation or to be impounded in great reservoirs, a total of nearly 400,000 acre feet, and that since said date the amount of land irrigated from the Arkansas River and its tributaries has been increased by nearly fifty per cent, all to the detriment of this defendant and its appropriation in Kansas. That as a result there is now appropriated and diverted in Colorado by the State and its citizens all of the normal flow of the said river and its tributaries; all of the seasonal floods, and all the waters thereof except unusual and infrequent floods in the plains country of eastern Colorado.

FOURTH.

Defendant admits all of the allegations of the fourth paragraph of said Bill of Complaint except as herein denied, and defendant denies:

That the doctrine of riparian rights is controlling in the State of Kansas, but alleges that beginning in 1868 Kansas has recognized the right to take water from its streams for purposes of irrigation; has recognized priority of right by priority of appropriation; has authorized the construction of canals for irrigation;

condemnation of lands for that purpose; and formation of corporations, which statutes are copied in full in Appendix to the answer of the defendant, The State of Kansas, and are incorporated herein by reference.

That this defendant calls the Court's particular attention to the fact that by the second proviso of Section 1, chapter 58, of the Session Laws of Kansas effective March 4, 1876, before Colorado became a State, the State of Kansas adopted precisely the doctrine of prior appropriation which proviso is as follows:

> "Provided further, That it shall be unlawful for any corporation or person to locate or construct any irrigating canal along or upon any stream of water, or take and use the waters of any stream in such manner as to interfere with or in anywise hinder, delay or injure any milling or irrigating improvements already constructed or located along or upon any stream of water, or to diminish the supply of water flowing to or through any established irrigating canal."

FIFTH.

This defendant admits all the allegations of fact in the fifth paragraph except as herein denied:

This defendant is without knowledge upon which it can either admit or deny that the State of Colorado by its Constitution and laws, has treated all of the flowing water in the State as the property of the State itself, permitting its citizens to acquire only usufructuary rights subordinate to the State ownership, given for the time being to private agencies but subject and subservient to the dominant will of the State.

This defendant further avers that whatever may be the Constitution, laws, and administrative system of the State of Colorado that neither of them have any extratorial force or effect which is binding upon this defendant, or in any way invalidate or qualify its rights as hereinafter set forth.

This defendant denies that the State of Colorado owns all of the flowing water within the limits of that State, and especially the flowing water of the Arkansas River and its tributaries, because the same is an interstate stream and must be shared equitably between the citizens of Colorado and the citizens of Kansas of whom this defendant is one, and is thereby entitled to such an allotment of water as will fulfill and make effectual its rights hereinafter set forth.

SIXTH.

This defendant admits the allegations of fact of paragraph six of the Bill of Complaint but denies all of the conclusions of law therein set forth, and alleges that the said paragraph is made up almost entirely of a legal argument and citations of authorities which have no place in a Bill of Complaint, which this answering defendant will meet upon the final argument of this case when the facts are before the court.

This answering defendant further submits that this Court will take judicial knowledge of the Constitution and laws of the State of Colorado and will interpret the same in its final judgment.

SEVENTH.

As to the seventh paragraph of the Bill of Complaint this defendant admits the existence of the Stat-

utes of the State of Colorado, copies of which are filed herein, supplemental to the Complaint, under the rules of this Court.

This defendant admits that the State of Colorado by its laws, decisions, and administrative system is responsible for the diversion of the water from the Arkansas River and that unlawful deprivation of this defendant's right of prior appropriation on said river is partly due to the system established by Colorado and its persistent denial of this defendant's rights.

As to the citation of authorities, legal arguments and legal conclusions contained in this paragraph this defendant submits that it cannot properly at this time admit, deny or qualify them. That this defendant is prepared in due time to brief and argue this case; that all of such legal arguments and conclusions are out of place in this Bill of Complaint which should contain only allegations of fact, and this defendant repectfully prays that it may be excused from entering into a legal argument at this time.

EIGHTH.

This defendant admits the allegations in paragraph eight with regard to the institution of the suit of the *State of Kansas* v. *Colorado*, and the other defendants therein.

This defendant avers that it was not a party to said action; did not appear in person or by Counsel; had no control of the said litigation, and that its rights hereinafter set forth were not considered or determined in the said cause; that the said suit was brought on

behalf of all of the citizens of Kansas, and more particularly for those residing on or near the Arkansas River; that there was no claim of priority of irrigation rights for this defendant set up in the said cause; no testimony taken as to the priorities between this defendant and Colorado irrigators on the Arkansas River and its tributaries, and so no such issue adjudicated. That the State of Kansas did not bring this action on behalf of any particular citizens but for the whole mass of its citizens and for a particular class on the Arkansas River.

This defendant denies that it was decided in that case that the State of Kansas alone could sue to prevent the unlawful acts of the State of Colorado and its citizens; that no such issue was argued or decided by the Court; that the said decision was a final decree upon one single point to-wit, That the State of Colorado did not own the entire flow of the Arkansas River because the river and its tributaries originated in that State, but that under the comity between States along an interstate river the State of Kansas was entitled to an equitable share of the flow of said river. This defendant specifically denies that there are now any negotiations pending between the State of Colorado and the State of Kansas looking to a division of the flow of the Arkansas River between the two states, and alleges further that such negotiations were undertaken about the year 1923 but were broken off and terminated in 1926 because the Commissioners from the State of Kansas found it impossible to make any sort of an equitable Treaty with the State of Colorado, and that since 1926

there have been no such negotiations pending, contemplated, or even thought of.

The defendant further alleges that the decision in *Kansas* v. *Colorado*, whatever its legal effect, was as of date of the institution of said cause in May, 1901, and not as of the date of the final decree of 1907.

Defendant further alleges that the issues involved in the case of *Kansas* v. *Colorado* were between the States as a whole, that the suit was not brought for the Kansas irrigators, but was brought partly upon the underflow theory which this court did not admit, and for the benefit of all those living in the valley of the Arkansas River in Kansas. That no specific appropriations were alleged as to the Kansas ditches and no claim made for priority for these ditches and they were only alluded to as part of the damage to the interests of the people of the State of Kansas for whom the State is guardian. That in this action the State of Kansas is demanding an equitable allotment of the flow of the Arkansas River for the irrigators in Kansas according to their appropriations under the rule laid down in *Wyoming* v. *Colorado*.

NINTH.

This defendant answering the ninth paragraph of said complaint admits all the allegations of the same except as herein denied and denies:

That Colorado and its citizens "have continued the diversion and use of the waters of the Arkansas River to the extent that the same existed and were in actual use at the dates included within the issues and testimony in the above mentioned cause" but avers

that on the contrary, as alleged in the preceding paragraph, that the State of Colorado and its citizens have paid no attention to the said decision, or the limits there set out, or the principles established, but have, on the contrary, diverted the flow of said river as alleged in the preceding paragraphs, so that at the present time no water crosses the State line from Colorado to Kansas during the growing season except slight and intermittent flows from floods on the plains of eastern Colorado.

TENTH.

This defendant admits all of the allegations of the tenth paragraph in the Bill of Complaint except as herein denied:

The defendant says that it has no information as to the taxable value of the lands and property dependent upon the drainage of the Arkansas River, or whether the same has increased or decreased, but alleges that such facts, whatever they may be, are utterly irrelevant and immaterial herein, and have no bearing on this case.

The defendant, however, admits that under the authority of *Kansas* v. *Colorado*, and *Wyoming* v. *Colorado*, this court should and will allot the flow of the Arkansas River between Kansas and Colorado upon the basis of beneficial use, at some period of time to be fixed by this Court, but that this defendant claims both under such allotment if it be made, and independently of such allotment, and under its rights of priority asserted in the two cases in the United

States District Court for the District of Colorado, its right to two hundred and fifty second feet of the flow of the Arkansas River or its equivalent in acre feet during the growing season for its individual use as hereinafter prayed for.

ELEVENTH.

For its Answer to the eleventh paragraph of the complaint this defendant admits every allegation of the said paragraph except as herein denied:

This defendant denies that any suits have been brought by citizens of Kansas against citizens of Colorado in defiance of the principles laid down in the case of *Kansas* v. *Colorado*, but that the said suits have been brought by corporations and individuals of Kansas against corporations and individuals of Colorado to enforce a priority in Kansas as against irrigators in Colorado under the well settled adjudications of the Lower Federal Court, and this court, concerning the interstate rivers.

That all of said suits have been brought and maintained for individual priority rights, rights which were never considered, adjudicated or in any way touched upon in the case of *Kansas* v. *Colorado*.

The defendant denies that the State of Colorado was a necessary party to any of said suits or to the suits now pending brought by this defendant in the United States District Court of Colorado, and elsewhere described in the complaint, and alleges that they are purely private suits to establish private conflicting rights.

TWELFTH.

This defendant admits all the allegations of the twelfth paragraph of said complaint except as herein denied:

This defendant denies that as to the two suits brought by this defendant in the United States District Court of Colorado entitled, as set forth in the Bill of Complaint, as The Finney County Water Users Association vs. Graham Ditch Co., *et al.*, and The Finney County Water Users Association vs. Coler Ditch Company, *et al.*, that the rights therein set up and sought to be enforced were ever put in issue, considered, tried and adjudicated in the case of *Kansas v. Colorado*, but were asserted private rights against the asserted wrongs of Colorado defendants as distinguished from the public right of the State of Kansas against the public wrong of the State of Colorado.

This defendant denies that in either of the said last named cases it sought to deprive any municipality of its supply of water for domestic purposes. This defendant denies that any irrigator claiming a water right of any consequence either on the river itself or its tributaries was omitted in the said case; that before preparing and filing the said suits this defendant caused, at great expense a survey and examination of all of the water rights of the Arkansas River and its tributaries to be made by A. A. Wieland, a competent Engineer, and formerly State Engineer of Colorado, and that after an examination of all the records of adjudication of priority of water rights and claims on the said streams, and an investigation upon the ground,

said Wieland made to this defendant a complete and elaborate report, showing the date, amount and location of every appropriation claimed or adjudication upon said streams, and that the names of the defendants impleaded in the said causes were taken from the report, and that this defendant believes and affirms that the said report was full, complete and accurate, and that the defendants included in the said two suits are all the parties in interest upon the said streams whose appropriations or diversions are of such an extent or consequence to be considered in such litigation. That it has never been the intention of this defendant, in its said litigation, to contest the right to the use of the water of said streams for domestic purposes, and this defendant submits that the question of superfluous parties or absent parties, or as to the nature of the use of the water diverted and all kindred questions belonged to the jurisdiction of the United States District Court of Colorado.

Defendant alleges further that if in the said cases brought by this defendant now pending in the United States District Court of Colorado or in this case in this Court it should be found and adjudged that this defendant is entitled to a priority against all or part of the defendants named in the said local cases, such judgment would not disturb the system of Colorado, but would have simply the same force and effect as an adjudication made between appropriators by the courts of competent jurisdiction in Colorado, and would be enforced in the same manner without destruction or even disturbance to the administration of water rights in Colorado.

This defendant denies that if any portion of the flow of the Arkansas River is adjudicated to this defendant any other ditch in Kansas can seize or make any claim to it.

THIRTEENTH.

This defendant admits all the allegations of the thirteenth paragraph of said Complaint except as herein denied:

This defendant again denies that any of the rights of this defendant were included in or adjudicated by the decree in the case of *Kansas* v. *Colorado*, or that this defendant is in any wise bound by said adjudication, or that the same is *res adjudicata* as between this defendant and individual appropriators in the State of Kansas, or any other persons, and the State of Colorado.

FOURTEENTH.

This answering defendant is in doubt how to meet the fourteenth paragraph of the Bill of Complaint. There is in it no allegation of fact but mere conclusions and argument which have no place in a Complaint, but this defendant specifically denies that there is any defect of parties in the two cases pending in the United States District Court for Colorado, this defendant vs. The Graham Ditch Company, *et al.*, and this defendant against The Coler Ditch Co., *et al.*, and alleges that the case of the Graham Ditch Company, *et al.*, has been pending in that Court for twelve years; and the case against the Coler Ditch Company, *et al.*, has been pending for nearly seven years, and during all that

time the defendants therein have wholly failed to make any complaint of a defect of parties or that any injustice would be done to any of them by such defect.

This defendant further calls the attention of this Court to the fact that this Court has now taken jurisdiction of the entire matter of conflicting rights between Colorado and Kansas and their citizens. That in the answer to the Bill of Complaint filed herein by the State of Kansas the names of all irrigators, that to our knowledge have any interest in this controversy are placed before the Court with the prayer that they be notified of the pendency of this action, that the State of Colorado claims to be the proprietor of all of the water they are using for irrigation, and is guardian for their rights, and that they be notified, and if such is not the fact that they shall appear herein and set up their claims.

This defendant in this connection adopts by reference all of the allegations of letter (k) of paragraph 22 of the Answer of the defendant The State of Kansas herein as fully as though herein set out.

This defendant submits that the other allegations and conclusions of said paragraph were simply persuasive to this Court as supporting Complainant's prayer that this Court take jurisdiction of this entire matter and this Court having done so the objections contained in said paragraph become wholly irrelevant and immaterial to the cause in this Court.

FIFTEENTH.

This defendant has no information upon which it can either admit or deny the allegations of the fifteenth paragraph of the Complaint as to whether:

(a) The State of Colorado owns the Monument Reservoir in El Paso County, Colorado, diverting and storing water from Fountain Creek, a principal tributary of the Arkansas River, which is administered as a reservoir having a priority, the waters of which are distributed among appropriation owners on the stream below.

(b) Whether the State of Colorado has constructed and owns the Boss Lake Reservoir in Chaffee County, Colorado, diverting and storing water from Cottonwood Creek, Chalk Creek, and the South Arkansas River tributaries of the Arkansas River, which is administered as having a reservoir priority. The waters thereof being distributed among the appropriators in said streams.

(c) Whether in connection with the State Penitentiary at Canon City, Colorado, the State of Colorado owns and operates a farm and applies thereon water from the Arkansas River diverted through the "Canon City Hydraulic and Irrigating Ditch," and also uses water for irrigation purposes from the Arkansas River diverted through the municipal diversion system of the City of Canon City; also owns the "Canon Mill Ditch" used for power purposes from the Arkansas River.

(d) Whether in connection with the State Hospital for the Insane at Pueblo, the State of Colorado carries on considerable farming operations for the support and use of the said institution, diverting water through the "West Pueblo Ditch" under various usufructuary

rights assigned to the said Ditch on the Arkansas River, with priorities of various dates from 1872 to 1883.

(e) Whether in connection with the State Institution for the Deaf and Blind at Colorado Springs, Colorado, the State irrigates and uses for domestic purposes water diverted from tributaries of the Arkansas River through the diversion system of the City of Colorado Springs under usufructuary rights granted said city.

(f) Whether in connection with the State Reformatory located at Buena Vista, Colorado, the State of Colorado carries on extensive farming operations by irrigation from the Arkansas River and various tributaries, and is the owner of water rights under the Maynard Ditch, the Cotton Creek Irrigation Ditch, the Helena Ditch, and the Gold Nugget Ditch, and has under lease the benefit as lessee of extensive water rights from the Trout Creek Ditch, the Helena Ditch, the Bray Ditch, the Harmony Ditch, the Gold Nugget Ditch, and the Fish Ditch from the Arkansas River and its tributaries.

Defendant alleges that whatever may be the rights of the State of Colorado under these allegations that the said State has appeared in this case, submitted to its jurisdiction; that this Court has taken control of the said controversies and that the rights above alleged by the State of Colorado will be fully protected as they may appear to this Court.

SIXTEENTH.

This defendant says that it is without knowledge as to whether any negotiations are pending between the State of Colorado and states other than the State of Kansas looking to a Treaty concerning interstate rivers and avers that the same are wholly irrelevant and immaterial herein.

This defendant denies as heretofore that there are now or have been for three years last past any negotiations pending between the State of Colorado and the State of Kansas looking to any Treaty, such negotiations were definitely broken off in 1926.

SEVENTEENTH.

This defendant again denies that the State of Kansas has since 1868 had in force a strict riparian doctrine of the waters flowing within its borders, this has been completely covered under Paragraph 4 of this Answer.

Counsel for Complainant here and elsewhere have alluded to the case of *Clark* v. *Allaman*, 71 Kansas 206. The Supreme Court of Kansas in that case was misled by its failure to note and give effect to the Statute of 1868 and the Statute of 1876 (set forth in the appendix to the answer of the defendant, the State of Kansas, herein) and failed to note that in the same code of 1868 which adopted the common law for the State of Kansas, the right to form corporations for the purposes of irrigation, to dig canals, and use water for that purpose was fully recognized. The Supreme Court of Kansas particularly failed to take note of the doctrine of strict prior appropriations enacted in

March, 1876, which is set forth in full in the fourth paragraph of this Answer.

In other words the Supreme Court of the State of Kansas in the case of *Clark* v. *Allaman* failed to go back to the Statute of 1868, where the common law and the right to use water for irrigation were recognized in Kansas in the same year and in the same code. This failure of the Supreme Court of Kansas to note the earlier Statutes naturally led this Court into the error of stating in *Kansas* v. *Colorado* that Kansas had a different system from Colorado.

This defendant further answering said paragraph alleges that under the Statutes cited herein, and in the answer of the State of Kansas, this defendant acquired a vested right of prior appropriation which neither the Constitution, nor the laws of the State of Colorado, nor even the decision of this Court in *Kansas* v. *Colorado* can divest or destroy.

EIGHTEENTH.

The eighteenth paragraph of said Complaint is addressed solely to the question of whether this Court should take jurisdiction over this controversy, and this Court having done so the said paragraph is now of no consequence whatever.

NINETEENTH.

The nineteenth paragraph of the said Complaint contains no allegations of fact whatever but is simply a summing up and reiteration of the arguments previously set forth.

TWENTIETH.

As to the twentieth paragraph this defendant notes with pleasure that now after more than forty-eight years of trespass on the rights of this defendant and other irrigators in Kansas the State of Colorado is willing to do equity.

TWENTY-FIRST.

This defendant admits that a Court of Equity is the appropriate Tribunal to determine the rights involved in this controversy.

TWENTY-SECOND.

This defendant further answering and in support of its prayer for affirmative relief herein alleges:

(a) That in December, 1880, the predecessor in interest of this defendant, the Kansas Irrigation, Water Power & Manufacturing Company, a corporation duly organized under the laws of Kansas, duly completed the construction of an Irrigation Canal with its intake on the SE¼ of Section 12, Township 24, range 35, Kearny County, Kansas, and turned the water of the Arkansas River into the said Ditch and put the water thereof to beneficial use for purposes of irrigation and that the said canal has ever since been used for irrigation purposes continuously, without any break or interruption whenever water could be obtained from the Arkansas River.

(b) As originally constructed the Canal was sufficient to irrigate from fifteen to twenty thousand acres and is now capable of irrigating from eight to ten

thousand acres, some of the laterals having been abandoned for lack of water as herein set forth.

(c) That by mesne conveyances the title to said irrigation canal has passed to this defendant by deed from The Finney County Farmers Irrigation Association, dated August 27, 1906, and that this defendant is now the owner thereof.

(d) That this defendant is a corporation duly organized and existing under the laws of the State of Kansas, co-operative in its character. Each owner of the land along the ditch owns one share of the value of $1.00 in the Canal itself for each acre owned, the water right being appurtenant to and inseparable from the ownership of the land irrigated and that said Corporation is conducted as a co-operative Association for the purpose of furnishing water to its shareholders and not for profit. That the holdings under the Ditch are mostly small ranging from eighty to three hundred and twenty acres.

(e) That from the time the said canal was constructed and the water turned into it it was highly successful. At that time there was ample water in the Arkansas River to serve the said canal and all of the land under it, and the land along the ditch was rapidly taken up, broken out and put into cultivation; that then as now the rainfall in that country was not sufficient for profitable dry farming, but that under the ditch and by irrigation large crops of a general character were raised and irrigation was highly successful, and the irrigators prospered, the amount of ir-

rigated land and land under cultivation steadily increased until the diversion and depletion of the waters of the Arkansas River as hereinafter set forth reduced the supply of water to the said canal.

(f) That the said canal was the second irrigation canal constructed on the Arkansas River in Kansas, and had a capacity and an appropriation right of the date of December, 1880, of 250 second feet, and prior to all others except the Garden City Ditch, and prior to all of the irrigators in Colorado taking water from the Arkansas River and its tributaries of any consequence.

(g) That beginning about 1884 or 1885 the owners of land in Colorado along the Arkansas River began constructing canals and taking water out of the river, all the land along the river up to that time being solely a grazing and cattle country. These diversions were increased in number and magnitude continuously from year to year until about 1901 the entire normal flow of the river was diverted in Colorado and the owners of the canal of this defendant were entirely deprived of any water during the growing season except from seasonal floods. That all of the appropriators in Colorado were subsequent in time and inferior in right to the appropriation of this defendant's predecessor, and that all of said diversions were unlawful and in derogation to the right of this defendant and its predecessor in interest. That as a result of said unlawful diversions about the year 1898 or 1899 the Garden City Irrigation Company, then owning the said Ditch, became insolvent, the mortgage on it was fore-

closed, and the ditch sold by decree of the Federal Court of the United States Circuit Court for the State of Kansas, to the Security Company of Hartford, the mortgagee; that the said insolvency of said Company and the forced sale of this property was caused solely and entirely by the unlawful diversions in Colorado as aforesaid.

That about the year 1901 the irrigators in Colorado having diverted and absorbed all the normal flow of the river in the growing season began diverting the waters of the tributaries of the Arkansas in Colorado either by canals, or direct irrigation, or by enormous reservoirs intended to and which do impound all of the flood waters of the said tributaries, so that the seasonal floods which this defendant formerly received for its canal during the growing season have been almost entirely and completely diverted and either directly used or impounded by irrigators in Colorado. That since the year 1901 these diversions of the tributaries of the Arkansas River have amounted to nearly 400,000 acre feet and that during that period the irrigators in Colorado by reason of said diversions have been able to increase the acreage by irrigation in that State along the Arkansas River and its tributaries by more than fifty per cent and that each and every one of said appropriations and diversions are subsequent in time and inferior in right to the appropriation rights of this defendant.

(h) That as a result of said unlawful diversions, the irrigation right of your defendant, which would be of great value, has been practically destroyed. Irriga-

tion from its canal instead of being continuous and steady through the growing season has become uncertain and infrequent.

(i) That at the time the said canal was constructed as aforesaid and ever since the State of Kansas has recognized the right to use water for irrigation; that prior in time is prior in right, and that this defendant has a vested right of prior appropriation as aforesaid in the flow of the Arkansas River to the extent of TWO HUNDRED AND FIFTY second feet.

(j) That this defendant has no adequate remedy at law.

Wherefore this defendant prays that in any decree entered by this court herein that the priority of right of appropriation of this defendant as aforesaid be recognized and decreed as against the State of Colorado and all of its citizens diverting water from the Arkansas River and its tributaries in that State, that the State of Colorado, and its officers, and all other citizens of Colorado who shall be parties to this suit, be perpetually enjoined from diverting any water from the Arkansas River or its tributaries in Colorado until this defendant's right of 250 second feet, or so much thereof as may be necessary for its needs during the growing season shall be satisfied.

That the citizens of the State of Colorado who are diverting water from the Arkansas River and its tributaries named as defendants in the United States District Court for the District of Colorado in the cases of this defendant vs. The Graham Ditch Company,

et al., and this defendant vs. The Coler Ditch Company, *et al.*, whose names appear in division (k) of paragraph Twenty-two of the Answer of the defendant, the State of Kansas, herein received a warning notice of the pendency of this action and the assumption by said State of Colorado of guardianship of their interests and right to appear for them, and that if they object to such assumption of authority that they appear and make their objections known, or in the alternative if this Court shall find that the persons last above named are necessary parties that an order be entered to that effect and subpoenas be issued to them in due course, and for such other and further relief as may be conformable to equity and good conscience.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Defendant, The Finney County Water Users Association.

FILE COPY

Office Supreme Court, U. S.
FILED
MAY 24 1929
CHARLES ELMORE CROPLEY
CLERK

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1928.

No. [redacted] Original [redacted] 9 [redacted] 6

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

MOTION OF DEFENDANT, THE FINNEY COUNTY WATER USERS' ASSOCIATION, FOR LEAVE TO AMEND ITS ANSWER.

Comes now the defendant, THE FINNEY COUNTY WATER USERS' ASSOCIATION, and moves the Court for leave to amend its Separate Answer by striking therefrom the following words to-wit: On page 20, in the first and second lines of the twenty-second paragraph, strike out "And in support of its prayer for affirmative relief herein"; and to strike out of subdivision J

of the twenty-second paragraph, on page twenty-four of said answer, all of the prayer of the said answer beginning "WHEREFORE this defendant prays" down to and including the words "equity and good conscience" and to substitute in lieu thereof the following:

"WHEREFORE this defendant prays the consideration of this Court of the rights and equities of this defendant dependent upon and involved in the allegations of fact hereinbefore contained, and that in any decree made by this Court said rights and equities may be given such consideration as is conformable to equity and good conscience."

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for The Finney County Water Users' Association, a Corporation.

FILE COPY

Office - Supreme Court, U. S.
FILED
APR 13 1942
CHARLES ELMORE CROPLEY
CLERK

IN THE

Supreme Court of the United States

October Term, 1941.

No. 5
Original.

THE STATE OF COLORADO,

Complainant,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a corporation,

Defendants.

STATEMENT AND SHOWING ON BEHALF OF THE STATE OF COLORADO

GAIL L. IRELAND,
Attorney General of the State of Colorado,
State Capitol,
Denver, Colorado,
A. W. MCHENDRIE,
Pueblo, Colorado,
HENRY C. VIDAL,
Equitable Bldg.,
Denver, Colorado,
ARTHUR C. GORDON,
Lamar, Colorado,
JEAN S. BREITENSTEIN,
Symes Bldg.,
Denver, Colorado,
Attorneys for Complainant.

CLARK QUICK-PRINTING CO., LAWRENCE 1932-34, DENVER, COLO.

IN THE

Supreme Court of the United States

October Term, 1941.

No. 5
Original.

THE STATE OF COLORADO,

Complainant,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a corporation,

Defendants.

STATEMENT AND SHOWING ON BEHALF OF THE STATE OF COLORADO

The State of Colorado, appearing by Gail L. Ireland, its Attorney General, at the request and by the direction of the Honorable Ralph L. Carr, Governor of the State of Colorado, presents this showing in opposition to the answer of the Defendants to the motion of the Complainant for the appointment of a Special Master and the affidavit filed in support thereof, and says:

1. Attached hereto as Exhibit A and submitted herewith is a copy of that certain stipulation made and entered into between the Complainant and the Defendants on December 18, 1933, and executed by the attorneys for the parties, and approved by Honorable Alf M. Landon, the then Governor of the State of Kansas, and Honorable Ed C. Johnson, the then Governor of the State of Colorado. An original of this stipulation was by the consent of

the parties introduced in evidence and made a part of the record of this cause and of the proceedings before the Honorable M. S. Atwood, the stenographic commissioner duly appointed by this Court to take such evidence, and such stipulation duly appears in the record at Volume 35, Pages 6054-6059. The copy attached hereto is duly certified by H. Lawrence Hinkley, Deputy Attorney General of the State of Colorado, as being a true and accurate copy of such stipulation as executed and as contained in the files of the Attorney General of the State of Colorado.

2. Attached hereto as Exhibit B and submitted herewith is the affidavit of Charles L. Patterson, Chief Engineer of the Colorado Water Conservation Board, the agency of the State of Colorado charged with the protection of the water rights of the State of Colorado.

3. Attached hereto as Exhibit C and submitted herewith is the affidavit of Gail L. Ireland, the Attorney General of the State of Colorado.

4. Attached hereto as Exhibit D and submitted herewith is a complete copy of the letter of January 5, 1940, referred to in paragraph numbered three of the affidavit of W. E. Stanley.

Respectfully submitted,

GAIL L. IRELAND,
Attorney General of the State of Colorado,
State Capitol,
Denver, Colorado,

A. W. MCHENDRIE,
Pueblo, Colorado,

HENRY C. VIDAL,
Equitable Bldg.,
Denver, Colorado,

ARTHUR C. GORDON,
Lamar, Colorado,

JEAN S. BREITENSTEIN,
Symes Bldg.,
Denver, Colorado,
Attorneys for Complainant.

EXHIBIT A

IN THE SUPREME COURT OF THE UNITED STATES

Original Case.

THE STATE OF COLORADO,

Complainant,

vs.

THE STATE OF KANSAS, and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a corporation,

Defendants.

STIPULATION.

THIS STIPULATION made and entered into this 18th day of December, 1933, by and between the State of Colorado, complainant herein, for and on its own behalf and on behalf of its citizens, its administrative officials and all ditch companies in the Arkansas River Basin, which are now or which may hereafter be diverting water from the flow of the Arkansas River, herein designated as first parties and complainant, and the State of Kansas on its own behalf and the Finney County Water Users Association, defendants herein, the State of Kansas acting on behalf of its citizens, its administrative officials and ditch companies, which are now or which may be hereafter diverting water from the flow of the Arkansas River.

WITNESSETH, That Whereas the above entitled case, now pending in the Supreme Court of the United States, includes a controversy between the State of Kansas and the State of Colorado as to the division and the use of the water supply of the Arkansas River, and the final submission of the case to the Court and the entry of decree therein will not be practicable to be reached for sometime in the future, and

WHEREAS there is under consideration by and on behalf of the United States of America the question whether it shall construct a dam across the main channel of the Arkansas River near the town of Caddoa, Colorado, some fifty miles West from the Kansas-Colorado line, to create a water reservoir upon and near the Arkansas River by means of said dam, which reservoir will probably have a capacity of about 680,000 acre feet of water, and

WHEREAS it is thought by the parties hereto that the construction and maintenance of such dam and reservoir, in addition to regulating the flow of water in the Arkansas River in order to guard against or lessen the damage from floods, will enable much of the water that flows in said river past the location of said proposed dam to be stored, regulated and conserved for beneficial use, and

WHEREAS the parties hereto, their officials, ditch owners and water users, recognizing the advantages which will accrue from the construction of said dam and reservoir are willing to cooperate in attempting to bring about such construction by the United States Government if assured of the protection not only to all rights which they now have and which are involved in the present controversy, but also to their existing water supply in the event said dam should be constructed and put in operation prior to a decree being entered in the Supreme Court of the United States, adjudicating the respective rights of the parties hereto; and

WHEREAS it is desired to provide for the cooperation of the State of Kansas and the State of Colorado for the use of their influence towards obtaining the construction of such dam and the creation of such reservoir by the United States of America, and to provide, as far as the said two States may, by this Stipulation, for the allocation between the two States of the water which might

be stored in such reservoir, so far as such water can be made available for beneficial use in Colorado and Kansas;

And it is also desired to secure the cooperation of the defendant herein, The Finney County Water Users' Association, for all of the purposes covered by this Stipulation;

NOW, THEREFORE, it is stipulated and agreed by and between the parties hereto as follows:

1. Each of said States and also the said The Finney County Water Users' Association, will use its influence so far as it is practicable to obtain the construction by the United States of America of said dam and reservoir, and said parties agree as between themselves to the allocation of the water that might be stored in said reservoir, as hereinafter set forth; it being understood that such allocation shall be subject to the storage and discharge of water stored in such reservoir by the United States of America in order to lessen or avoid damages from floods.

2. That the construction and operation of said dam and reservoir shall not disturb the status quo of the diversion of water for beneficial uses from said Arkansas River by the ditches and canals now constructed and operated in both of the States of Colorado and Kansas. IT IS UNDERSTOOD AND AGREED that in order to maintain the status quo of said diversion as hereinabove referred to there shall be allocated to the State of Kansas for delivery at the State line in the Arkansas River from Colorado into Kansas a quantity of water up to 77,000 acre feet annually, of which amount 52,000 acre feet thereof shall be delivered to the State line during the irrigation season from April 1 to October 1 of each year as and when required by the Kansas State water officials, and 25,000 acre feet thereof to be delivered during the non-irrigating season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for

irrigation or storage; and for irrigation of lands in Colorado below said reservoir a quantity of water up to 160,000 acre feet annually.

3. If the flow of water in the Arkansas River into the reservoir, and into the Arkansas River below the reservoir from other sources than the reservoir shall be insufficient to supply the total amount allocated as provided in paragraph 2 hereof; then in that event the said waters shall be prorated between Colorado and Kansas in the relation hereinabove in paragraph 2 hereof set forth.

4. After the allocation of water as provided in the next preceding paragraphs, all additional water which may be impounded in said reservoir, excepting, always the amounts of water discharged for flood control purposes, hereinafter referred to, shall constitute surplus and shall be allocated one-half to Colorado and one-half to Kansas, said surplus to be determined April 1, annually, or such other date as may be mutually agreed upon by water officials of the two States, and the amount allocated to each State shall be discharged from said reservoir from time to time on request of the Water Officials of each State respectively for the water allocated to it, but the release of such water on demand shall not be considered as constituting any part of the amounts specified in paragraph 2 herein.

5. All exchanges of water between the Colorado ditches whose headgates are below said reservoir and those whose headgates are above said reservoir shall be confined and limited to, and supplied from Colorado's portion of the surplus waters stored in said reservoir, as provided for in paragraph 4 hereof, and all such exchanges shall be charged against Colorado's share of the surplus in ascertaining the 50-50 division between the two states.

6. Any water releases from said reservoir for flood control or because of lack of reservoir capacity shall not be charged to either State unless such releases are coincident with the request for water on behalf of said State or the use and diversion by the ditches in such State, and then only to the extent of the request or use so made by it, in which event it shall be charged against the State so requesting or using the amount so requested or diverted.

7. The provisions in this Stipulation for allocation of flow of water shall become effective when such dam shall have been constructed and water begun to be stored in said reservoir.

8. This Stipulation is without prejudice to the claims of either party hereto in the above entitled case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties hereto to water flowing in the Arkansas River, or stored in said reservoir.

9. That joint control, regulation and administration of the storage and discharge of all waters in said dam and reservoir shall be had by and between Kansas and Colorado.

10. This Stipulation shall not be filed in this action until the construction of said dam and reservoir by the United States Government shall be assured.

(Signed) PAUL P. PROSSER,
Attorney General of Colorado

(Signed) A. W. MCHENDRIE,
(Signed) HENRY C. VIDAL,
Solicitors for Complainant,

(Signed) ROLAND BOYNTON,
Attorney General of Kansas,

(Signed) JOHN G. EGAN,
(Signed) CHESTER I. LONG,
W. E. STANLEY,
(Signed) F. DUMONT SMITH,
Solicitors for Defendants.

Approved:

(Signed) ED C. JOHNSON,
Governor, State of Colorado,

(Signed) M. C. HINDERLIDER,
State Engineer of Colorado,

Approved:

(Signed) ALF M. LANDON,
Governor of Kansas,

(Signed) GEO. S. KNAPP,
Chief Division of Water Resources,
State of Kansas.

STATE OF COLORADO }
City and County of Denver } ss.

H. Lawrence Hinkley, being duly sworn upon oath deposes and says that he is the duly appointed, qualified and acting Deputy Attorney General of the State of Colorado;

That he has compared the foregoing stipulation with the original thereof, signed by the representatives of the parties and approved by the then Governor of the State of Kansas and the then Governor of the State of Colorado, which is in his custody as Deputy Attorney General of the State of Colorado, and that the foregoing is a true, accurate and complete copy of said original stipulation.

Dated at Denver, Colorado, this 7th day of April, A. D. 1942.

H. LAWRENCE HINKLEY.

Subscribed and sworn to before me this 7th day of April, A. D. 1942.

Witness my hand and official seal.

My commission expires July 6, 1942.

ANN G. LANDY,
Notary Public.

The original of this affidavit is filed with the Clerk of the Supreme Court of the United States.

EXHIBIT B

STATE OF COLORADO }
} ss.
City and County of Denver }

Charles L. Patterson, being first duly sworn, upon his oath, deposes and says:

That he is now and at all times since July 1, 1937, has been the duly appointed, qualified and acting Chief Engineer of the Colorado Water Conservation Board, the agency of the State of Colorado charged with the protection of the water resources of Colorado, and in his official capacity as such he has directed the engineering investigations made by the State concerning the Arkansas River and its tributaries, the interstate stream involved in this suit; that at all times since the filing of this case he has been familiar with the said interstate stream and with official records concerning its flow at various stations, and has participated in the preparation and presentation of much of the engineering testimony on behalf of the State of Colorado, and has appeared and testified on behalf of Colorado in the pending litigation; that prior to the filing of this case and at all times since about the year 1910 he has been acquainted with and has made investigations on the said interstate stream; that he has had knowledge of each of the several disputes between water users in Kansas and water users in Colorado; that he has read the answer of Defendants, the State of Kansas and The Finney County Water Users' Association, a corporation, to the motion of Complainant, the State of Colorado, for the appointment of a Special Master, and the affidavit of W. E. Stanley in support thereof, and he makes this affidavit for the purpose of presenting to the Court facts in connection with the pending controversy.

That on May 20, 1901, the State of Kansas filed a bill against the State of Colorado, and on August 17, 1903,

filed an amended bill naming as co-defendants the Graham Ditch Company and other corporations that had appropriated and were then diverting and using waters of the Arkansas River for irrigation purposes in Colorado, asserting, among other things, that the substantial interests of the State of Kansas, including the irrigation ditches in the western part of Kansas had sustained great and incalculable injury by reason of the appropriations, diversions and uses of waters of the Arkansas River in Colorado; that in its decision of May 13, 1907, the Court held that,

> "If the depletion of the waters of the river by Colorado continues to increase, there will come a time when Kansas may justly say that there is no longer an equitable division of benefits, and may rightfully call for relief against the action of Colorado, its corporations and citizens, in appropriating the waters of the Arkansas for Irrigation,"

and the Court dismissed the bill of the State of Kansas as against all defendants without prejudice to the rights of the State of Kansas,

> "to institute new proceedings whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations and citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two States resulting from the flow of the river."

That subsequent to the decision of May 13, 1907, as above outlined, the State of Kansas, did not call for relief against the State of Colorado, its corporations or citizens, until it was required to answer the bill filed by the State of Colorado on leave granted January 3, 1928, and during the interval the State of Kansas failed and refused to be a party to litigation initiated by individual claimants in the State of Kansas as against appropriators and water users in the State of Colorado, as hereafter mentioned.

That on August 27, 1910, the case entitled, "The United States Irrigating Company v. The Graham Ditch Company, et al," was filed in the District Court of the United States, District of Colorado, being Case No. 5578, the object and purpose of which was to procure a decree establishing the claimed legal title by priority dates and amounts, regardless of state lines, of certain ditches in Western Kansas, as against the priorities and rights of the ditches and appropriators in Colorado awarded them by the Courts of the State of Colorado; that the said Case No. 5578 was settled by a contract dated February 19, 1916, under the terms of which the priorities of the Kansas ditches signatory thereto were recognized as of Date August 27, 1910, and wherein the Colorado appropriators agreed not to apply for or claim priorities for storage purposes on the Purgatoire River, or on the Arkansas River below the mouth of the Purgatoire River of earlier date, and agreed to pay the costs of said suit and also further sums of money to the signatory Kansas irrigation companies and irrigators; that the said payments were made and accepted, and the said priority dates have since been observed, no priorties for storage purposes having been applied for or claimed by the signatory Colorado ditches on the Purgatoire River or on the Arkansas River below the mouth of the Purgatoire River; that the owners of four of the five irrigating ditches in Kearney and Finney Counties in Kansas, and also the owners of the Lake McKinney Reservoir in Kearney County, Kansas, were parties to the said contract of February 19, 1916; that The Finney County Water Users' Association, owners of the Farmers Ditch in Finney County, Kansas, alone refused to become a party to the settlement contract of 1916, and thereafter in November, 1916 it filed a suit against the Graham Ditch Company and other irrigation companies in Colorado, being Case No. 6633, and later filed a second suit against the Coler Ditch and Reservoir Company and other appropriators and water users in Colorado, being

Case No. 7493, both in the District Court of the United States, District of Colorado, seeking to establish on the Arkansas River a system of interstate administration based on individual priorities regardless of state lines; that at the time the said Cases No. 6633 and No. 7493 were filed, and at all times since May 16, 1911 the said Finney County Water Users' Association has been obligated to deliver to the said ditches and reservoirs in Kearney and Finney Counties whose rights were determined and defined by the aforesaid agreement of February 19, 1916, 16/21st of all the divertible water supplies of the Arkansas River in said Counties in the State of Kansas, including such supplies as The Finney County Water Users' Association might acquire away from ditches in Colorado under decisions rendered in the said Cases No. 6633 and No. 7493.

That on leave granted January 3, 1928, the State of Colorado filed its pending bill, seeking to terminate the harassment to which its water users were subjected by the said suits of The Finney County Water Users' Association; that issues were joined in this case and this Court directed that evidence be taken before the Honorable M. S. Atwood, as stenographic commissioner; that thereafter such taking of evidence began and continued to the month of December, 1939.

That on or about the year 1933 an opportunity presented itself to secure the construction by the United States, Corps of Engineers, of a dam and reservoir on the Arkansas River near Caddoa, Colorado, to be located downstream from the mouth of the Purgatoire River, and at a point on the Arkansas River about 58 miles upstream from the Kansas-Colorado boundary line, the said reservoir having the combined purpose of flood control and water conservation; that representatives of the State of Kansas having threatened to protest against authorization of the said project and having threatened to enjoin its construction unless previously the rights of the State of

Kansas and its water users therein had been determined and defined, and in contemplation of the construction of said dam and reservoir, the two states entered into a stipulation, under date of December 18, 1933, copy of which is submitted herewith as Exhibit A.

That thereafter and by mutual consent, recognizing the uncertainties and delays incident to authorization, the securing of appropriations by the Congress, and the construction of the said Caddoa Dam and Reservoir, the name of which subsequently was changed to the John Martin Reservoir Project, testimony was submitted intermittently and only at intervals, and because of the said stipulation of 1933, no evidence was presented concerning stream flows, water supplies or irrigation needs subsequent to the year 1932, or concerning the additional supplies to be made available for irrigation uses by reason of the construction and operation of Caddoa Reservoir.

That the construction of the said Caddoa Dam and Reservoir and the appurtenant works was authorized by Congress in the Flood Control Act of 1936; the first appropriation of funds for initial construction was included in the Flood Control Act of 1938; construction of the said Caddoa Dam is now under way and is partially completed, and funds and materials are available for some further construction, but are insufficient to complete the said reservoir to its designed capacity; that because of the recent war emergency, certain items of construction including the main flood control gates cannot be secured at this time, and as to when the said gates can be obtained so as to complete the said dam and reservoir there is some uncertainty; that in order to properly determine the relative rights of the two states, it is necessary that testimony be presented concerning Caddoa Reservoir and the effect of its ultimate and fractionally complete capacity upon the water supplies of the Arkansas River available and to be made available by the said project.

That the Complainant herein has not previously offered testimony or evidence as to the effect of the storage of water in the said Caddoa Reservoir upon the regimen of the stream flow because Complainant believed that the stipulation of 1933 conclusively determined the rights of the States of Colorado and Kansas and of the citizens and water users of the two states in and to the irrigation benefits of the said Caddoa Reservoir and in and to the water supplies to be made available for additional irrigation uses by the said project; that representatives of the Defendants have asserted and now continue to assert that the said stipulation of 1933 is merely an interim agreement to be effective only until a decree is entered by the United States Supreme Court in this case; that while the State of Colorado does not acquiesce in nor agree with the position taken by representatives of the Defendants, it believes that in order to expedite the matter and to have all the facts before the Court, it is necessary that evidence be presented as to the effect which the storage of water in the said Caddoa Reservoir will have upon the regimen of the stream flow of the Arkansas River and upon the water supplies of said river that are or may become available for irrigation use; and that because the said Caddoa Reservoir is not yet completed and has not been placed in operation as contemplated by the stipulation of 1933 and because its operation will materially affect the water supplies of the Arkansas River available for irrigation purposes, it is necessary to a proper determination of the rights of the parties hereto, that evidence as to the effect of such storage of water in the said Caddoa Reservoir be presented in this case.

That beginning about January, 1940, the parties hereto entered negotiations for a settlement of the interstate controversy involved in this suit; that such negotiations were not hurried, for the reason that the anticipated date of completion of the said Caddoa Dam and Reservoir would not have arrived, had it not been further deferred by

the war emergency, until late in the year 1942 or early in the year 1943; that not until recently did it become apparent to Complainant that an amicable adjustment was not to be reached, because of the Defendants claiming such a large share of all the water resources of the Arkansas River in Colorado that, to satisfy such claims, there would be required some of the waters which this Court by its decree of 1907 found and determined to have been appropriated, diverted and used, and to come within Colorado's equitable share of the total of the said interstate stream, and in addition thereto would require all of the surplus water supplies to become available for additional irrigation use when Caddoa Dam and Reservoir is completed to its full capacity, thus nullifying the provisions of the stipulation of 1933.

That as a result of the failure of the parties to reach an agreement for the settlement of the pending controversy, it becomes necessary to have the same determined by the Court; that promptly, when the necessity for such procedure appeared, the Complainant at once negotiated with representatives of Defendants for a joint application to the Court for directions as to further procedure; and that upon refusal of representatives of Kansas to agree to any application contemplating the taking of further testimony, the State of Colorado then filed herein its motion for the appointment of a Special Master.

That the preparation and presentation of such further evidence concerning stream flows and water supplies, as affected by the recent cycle of drouth seasons, and as they may be affected by the operation of the said Caddoa Reservoir, can be accomplished in a reasonably short time, probably by the time the Master has acquainted himself with the testimony heretofore presented, and will, therefore, occasion no unreasonable delay nor impose any material expense on the Defendants.

That in the year 1907, a stream gaging station was established on the Arkansas River near the boundary line between the States of Colorado and Kansas, which station has since been maintained by the State of Colorado in cooperation with the United States Geological Survey, and at which the quantities of water flowing from Colorado into Kansas have been recorded; that while said quantities are variable from year to year, month to month, and day to day in accordance with variable and intermittent amounts of natural precipitation, when considered as averages over a series of years the said quantities have been as large during recent years, and during the summer months of the irrigation seasons of recent years, as prevailed at the time of and immediately following the decision of 1907; that by reason of insufficient diversion and storage capacities along the Arkansas River in Western Kansas, a major share of the said state line flows, considered as long-time averages, are undiverted and unused in the State of Kansas.

Dated at Denver, Colorado, this 7th day of April, A. D. 1942.

CHARLES L. PATTERSON.

Subscribed and sworn to before me this 7th day of April, A. D. 1942.

Witness my hand and official seal.

My commission expires July 6, 1942.

ANN G. LANDY,
Notary Public.

The original of this affidavit is filed with the Clerk of the United States Supreme Court.

EXHIBIT C

STATE OF COLORADO }
} ss.
City and County of Denver }

Gail L. Ireland, being first duly sworn, upon oath deposes and says that he is the duly elected, qualified and acting Attorney General of the State of Colorado, and in his official capacity and by the direction of the Honorable Ralph L. Carr, Governor of the State of Colorado, he represents the State of Colorado in this case;

That he has read the answer of Defendants, State of Kansas, and The Finney County Water Users' Association, a corporation, to the motion of Complainant for appointment of a Special Master, and the affidavit of W. E. Stanley filed in support thereof;

That the statement in said answer that "the request for taking additional testimony has been interposed to effect further delay and to prevent these Defendants from having a determination of the issues involved in this suit" is not true; that such request has been presented solely for the purpose of having before the Court all pertinent testimony necessary for a proper determination of this controversy;

That the State of Colorado has no desire to and does not intend to do anything to protract the taking of testimony to the prejudice of the rights of the Defendants; that the State of Colorado agrees that a speedy determination of this cause is desirable but the State of Colorado believes that for the serious and long-standing controversy between these litigants to be finally settled it is necessary that the Court have before it at the time of its decision all pertinent evidence and thereby prevent a determination which might result in further misunderstandings and litigation between the parties hereto;

That the negotiations for settlement of this case begun on or about January, 1940 were in good faith and not for delay so far as the State of Colorado is concerned, and that the State of Colorado considered that through such negotiations a settlement of this controversy might be reached earlier than possible through court decision, and that the State of Colorado earnestly, patiently, and assiduously carried on such negotiations with the hope and expectation of making such settlement, and that upon the termination of such negotiations the State of Colorado promptly presented to this Court its motion for the appointment of a Special Master;

That since May, 1941, when he began to actively participate in this case the major topic of discussion at the conferences held for the purpose of negotiating a consent decree was the effect that the construction, operation and use of Caddoa Reservoir would have upon the available water supply of said reservoir and the applying of said water to a more economical and widespread beneficial use;

That submitted herewith and marked Exhibit D is a true, accurate and complete copy of that certain letter dated January 5, 1940 and referred to in paragraph numbered three of the affidavit of W. E. Stanley.

Dated at Denver, Colorado, this 7th day of April, A. D. 1942.

GAIL L. IRELAND.

Subscribed and sworn to before me this 7th day of April, A. D. 1942.

Witness my hand and official seal.

My commission expires July 6, 1942.

ANN G. LANDY,
Notary Public.

The original of this affidavit is filed with the Clerk of the United States Supreme Court.

EXHIBIT D

OFFICES

HODGES, VIDAL & GOREE
EQUITABLE BUILDING
DENVER, COLORADO

January 5, 1940.

Mr. W. E. Stanley,
First National Bank Building,
Wichita, Kansas.

Dear Mr. Stanley:

Re: *Colorado* v. *Kansas*

With reference to your suggestion that since the taking of testimony in the above case has been completed we should arrange a program as to further procedure therein, we have conferred with the Colorado officials and our engineering associates, and beg leave to submit the following suggestions:

Since the construction of the Caddoa Reservoir now seems to be assured and the stipulation of 1933 has been filed in the case, we feel that there is presented a sound and practical opportunity for the allocation and distribution of the waters of the Arkansas River between the states of Colorado and Kansas to the mutual benefit of the water users of those two states.

We believe that the many problems involved in this long drawn-out and expensive legal controversy can, and should, be solved to the best interest of both states and the water users thereof by a conference between the representatives of each state, at which conference a fair and earnest effort should be made to arrive at the terms of a consent decree which may be entered in the Supreme Court.

All the pertinent facts material to this controversy have been exhaustively developed and are now in the record, and while we may differ as to the interpretation and construction of some of those facts, nevertheless, we should be able to arrive at a more reasonable and equitable judgment than would probably be possible for any court to reach, in the face of the extraordinarily lengthy record with which it will be confronted.

We, therefore, suggest that before we adopt any definite plan or program which would incur further expense and entail an immense amount of labor, we should at least make an honest and earnest effort to see if we cannot reach an agreement as to such a consent decree. To that end, we suggest that the Governors, Attorneys General, Engineers and Counsel of the respective states get together "around the table" at a conference, to be held at some convenient place in the near future, and see if we cannot agree upon the judgment to be entered in this matter.

We are authorized to say that the Governor and Attorney General of Colorado are heartily in accord with this suggestion, and will be glad to contribute whatever time and effort that may be deemed advisable to bring about this end.

The conspicuous success which attended the adjustment of the Rio Grande River controversy between Colorado, New Mexico and Texas by this method; and the adjustment of the serious and long drawn-out controversy between the seven states affected by the Colorado River

Compact; by means of a series of such conferences, leads us to believe that more can be attained in this way than by continued litigation.

We shall be pleased to have your reaction to this suggestion at your early convenience.

Yours very truly,
HENRY C. VIDAL,
A. W. MCHENDRIE.

HCV/f

CC: HON. RALPH L. CARR,
Governor of Colorado,
Denver, Colorado,

HON. JAY S. PARKER,
Attorney General,
Topeka, Kansas,

HON. BYRON G. ROGERS,
Attorney General,
Denver, Colorado.

FILE COPY

Office Supreme Court, U. S.
FILED
MAY 13 1929
CHARLES ELMORE CROPLEY
CLERK

In the Supreme Court of the United States.

No. [redacted] Original, October Term, 1928. 176

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

MOTION OF DEFENDANTS FOR ADDITIONAL PARTIES, ETC.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,
JOHN G. EGAN,
Assistant Attorney-general of the State of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association.

12-7010

In the Supreme Court

of the United States.

No. 14 Original, October Term, 1928.

THE STATE OF COLORADO, *Complainant,*

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation. *Defendants.*

MOTION OF DEFENDANTS FOR ADDITIONAL PARTIES, ETC.

Now come the state of Kansas and The Finney County Water Users' Association, defendants in the above-entitled case, and by leave of court file this their motion, and show the court that in the twenty-second paragraph of the answer of the state of Kansas, and at pages 41 to 44, inclusive, thereof, where it makes allegations for affirmative relief, it sets out a list of residents and citizens of Colorado who have been made defendants in the two suits by the Finney County Water Users' Association, as complainant, pending in the district court of the United States for the district of Colorado, being 166 parties in all; and that it alleges in substance in its answer, at pages 44 to 46 thereof, that said parties have taken water, for the purpose of irrigation of land, from the Arkansas river, or its tributaries, in Colorado to the wrongful injury and damage of the defendant, the Finney County Water Users' Association, and also to the wrongful injury and damage of other parties, residents and citizens of Kansas and to owners and occupants of land in the Arkansas Valley in Kansas; and it alleges in said answer that said

residents or citizens of Colorado threaten to, and will unless enjoined, increase their taking of water from the Arkansas river and its tributaries in Colorado for irrigation of lands in that state; and it prays in its answer that said parties be required to file a written statement herein as hereinafter indicated, or be made parties hereto.

Wherefore, the state of Kansas moves the court that each of the said residents or citizens of Colorado described as aforesaid be required by order of this court, in the alternative, either to file a written statement in this case to the effect that the state of Colorado represents each of them respectively in all of the issues of this case, the same as if they were parties herein, and that they will be bound by any orders or decrees of this court the same as if they were parties herein, or else that the said parties be made parties defendant to this suit, and in such contingency that this court issue subpœnas, or proper process, to each of said parties summoning them to appear herein and present their answers, if any, to the claims for affirmative relief of the state of Kansas, as set forth in its answer.

WILLIAM A. SMITH,
Attorney-general of the State of Kansas,

JOHN G. EGAN,
Assistant Attorney-general of the State of Kansas,

CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association.

12-7010

FILE COPY

Office Supreme Court, U. S.
FILED
MAY 13 1929
CHARLES ELMORE CROPLEY
CLERK

In the Supreme Court of the United States.

No. [redacted] Original, October Term, 1928. 976

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

BRIEF FOR THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION IN SUPPORT OF THEIR MOTION TO REQUIRE CERTAIN COLORADO IRRIGATORS TO BE MADE DEFENDANTS HEREIN, ETC.

WILLIAM A. SMITH,
Attorney-general of the state of Kansas,
JOHN G. EGAN,
Asst. Attorney-general of the state of Kansas,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association.

12-7080

INDEX.

PAGE

STATEMENT 3

POINTS AND AUTHORITIES 8

ARGUMENT 9

CASES CITED:

California v. Southern Pacific Railroad Company, 157 U. S. 229, 256; 39 L. Ed. 683 ..... 8, 11

Kansas v. United States, 204 U. S. 331; 51 L. Ed. 510 .. 8, 10

Louisiana v. Texas, 176 U. S. 1, 16; 44 L. Ed. 347 ..... 8, 10

Massachusetts v. Mellon, 262 U. S. 447, 481, 482; 67 L. Ed. 1078 ..... 8, 10

Minnesota v. Northern Securities Company, 184 U. S. 199, 246, 247; 46 L. Ed. 499, 520 ..... 8, 11

Missouri v. Illinois, 180 U. S. 208, 234, 235, 240; 45 L. Ed. 497, 509, 510, 512 ..... 8, 10

New Hampshire v. Louisiana, New York v. Louisiana, 108 U. S. 76; 27 L. Ed. 656 ..... 8, 10

New Orleans Water Works Company v. New Orleans, 164 U. S. 471, 480; 41 L. Ed. 518, 523 ..... 8, 11

North Dakota v. Minnesota, 263 U. S. 365, 374-376; 68 L. Ed. 342, 345, 346 ..... 8, 10

Oklahoma v. Atchison, Topeka & Santa Fe Ry. Co., 220 U. S. 277; 65 L. Ed. 465 ..... 8, 10

Pennsylvania v. West Virginia and Ohio v. West Virginia, 262 U. S. 553, 595, 616, 617; 67 L. Ed. 1117, 1131, 1140, 1141 ..... 8, 12

Wyoming v. Colorado, 259 U. S. 419; 66 L. Ed. 999 ..... 8, 13

EQUITY RULES CITED:

Equity Rule No. 37 11

Equity Rule No. 38 ..... 9, 10

In the Supreme Court of the United States.

No. 14 Original, October Term, 1928.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

BRIEF FOR THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION IN SUPPORT OF THEIR MOTION TO REQUIRE CERTAIN COLORADO IRRIGATORS TO BE MADE DEFENDANTS HEREIN, ETC.

STATEMENT.

The state of Kansas and the Finney County Water Users' Association have filed a joint motion herein, with reference to 166 persons alleged in the answers of the two defendants to be irrigators in Colorado and to have been taking water and to threaten to continue to take water for irrigation of lands in Colorado from the Arkansas river and its tributaries in that state, to the wrongful injury and damage, among others, of the defendant, the Finney County Water Users' Association, and certain other irrigators in Kansas who are alleged in the Answers to have rights to take water for irrigation of lands from the Arkansas river in Kansas. The motion in its prayer follows in substance the prayer in the separate answers of the defendants; that is, that the said Colorado irrigators should be required by order of this court, in the alternative, either to file

a written statement in this case to the effect that the state of Colorado represents each of them respectively in all of the issues of this case, the same as if they were parties herein, and that they will be bound by any orders or decrees of this court in this case the same as if they were parties herein, or else that the said parties in Colorado be made parties defendant to this suit, and in such contingency that this court issue subpœnas or other proper process to each of said Colorado parties summoning each of them to appear herein and present their answers, if any, to the claim for affirmative relief of the state of Kansas hereinbefore set forth.

The prayer of the answer of the state of Kansas asks, among other things, that this court by its decree will protect and quiet the rights of citizens and residents of Kansas to their appropriations of water in the Arkansas river for irrigation of lands in Kansas as against the acts of parties in Colorado who have later rights, or no rights, to take water from the Arkansas river, or its tributaries, in Colorado, for the purpose of irrigation, and that it will protect and quiet the rights of the defendant, the Finney County Water Users' Association to its appropriating of water from the Arkansas river in Kearny county, Kansas, for agricultural irrigation as against not only the state of Colorado but also the said irrigators in Colorado which are above referred to.

See Answer of the state of Kansas, pp. 46-48.

The answer of the Finney County Water Users' Association asks, among other things, for relief by protection of its rights to take water from the Arkansas river in Kansas for irrigation against the said irrigators in Colorado. (Answer of said defendant, pp. 24, 25.)

The state of Kansas makes allegations asking affirmative relief against said irrigators in Colorado in the twenty-second paragraph of its answer, pp. 30-46. It makes allegations concerning the two suits brought by the Finney County Water Users' Association, one

against the Graham Ditch Company et al., and the other against the Coler Ditch and Reservoir Company et al., in the United States district court for the district of Colorado. (pp. 40-46, answer o the state of Kansas.)

There are 166 of these defendants in those two last named cases, the names of which are set out in said answer at the place referred to. Of these, one hundred and seventeen are individuals, three are irrigation districts under the laws of Colorado, one a town, one a city in that state, and forty-four are corporations. These are alleged to be citizens or residents of Colorado and the answer states that these Colorado irrigators have been taking and that they threaten to take water from the Arkansas river and its tributaries in Colorado, and among other things, that the Finney County Water Users' Association and the owners of twelve other ditches in Kansas, constructed and which have been used to take water from the Arkansas river for irrigation of lands in Kansas, the intake of one of which, however, is in Colorado about 2½ miles west of the Kansas line, have prior appropriation righths to the taking and use for irrigation of the water which has been taken, and is threatened to be taken as aforesaid, in Colorado, by the 166 Colorado parties referred to.

The names of the Kansas ditches, other than that of the Finney County Water Users' Association, with the exception of two which are not named, are set out at pages 33-35 of the answer of the state of Kansas. The names of such ditches are: Frontier ditch, Alamo ditch, Fort Aubrey ditch, Amazon ditch, South Side ditch, Great Eastern ditch, Garden City ditch, Eureka ditch, Taylor's South Side ditch, West Kansas flood ditch.

There are two of the Kansas ditches in question the names of which are not given in the answer of the state of Kansas.

The answer of the state of Kansas alleges that the Finney County Water Users' Association and the owners of the other Kansas ditches referred to have superior rights of appropriation of said water to the claims of the said parties in Colorado.

It is also alleged in said answer that the acts of said Colorado parties referred to have been with the permission and aid of the state of Colorado and with its purported authority (p. 37, separate answer of the state of Kansas).

In the answer of the Finey County Water Users' Association it alleges at paragraph eleventh, p. 11; that it has prior rights to said water against the defendants in its two suits brought in the United States district court in Colorado. Further allegations on this point are made in paragraph twelfth, pp. 12-14, *id.*; paragraph fourteenth, pp. 14 and 15, *id.*; and paragraph twenty-second, pp. 20-24, *id.* This answer adopts by reference the allegations in subdivision *k*, paragraph twenty-second, pp. 40-46, of the answer of the state of Kansas, wherein are set out the names of said Colorado irrigators.

In each of the answers it is alleged that the Finney County Water Users' Association has prior rights to the use of said water for irrigation of said lands over said irrigators in Colorado, and that such rights are the private rights of the Finney County Water Users' Association. In the answer of the state of Kansas similar allegations are made with reference to the owners of the other Kansas irrigating ditches mentioned.

Statements in the pleadings specifying or to the effect that there are controversies as to priorities of water appropriation rights, which controversies vary in regard to the facts and the times of the complaints, are set out in the pleadings at the following named paragraphs and pages:

In the bill of complaint of Colorado, paragraph twelfth, pages

29-38; paragraph fourteenth, pages 35, 36; paragraph nineteenth, page 46, subdivision *f*, page 46, subdivision *i*, page 47.

In the answer of the state of Kansas, paragraph eleventh, page 14; paragraph twelfth, page 17; paragraph fourteenth, page 21; paragraph seventeenth, page 26; paragraph twenty-second, pages 37-39, 44-46.

In the answer of the Finney County Water Users' Association, paragraph eleventh, page 11; paragraph twelfth, pages 12, 13; paragraph twenty-second, pages 22-24.

The motion in question is made on the ground that the controversies between the Finney County Water Users' Association and the other owners of Kansas irrigating ditches on the one hand, and said Colorado irrigators on the other hand, are as to private and several priorities and that owing to the number of the Colorado irrigators and the differences in times of the beginning of their claims, there are many separate controversies as to priorities between the Finney County Water Users' Association, and the other Kansas ditch owners, respectively, and those Colorado irrigators, and that as to such controversies the Colorado irrigators, unless they be required to file a statement, as above indicated, or be made parties to this suit, will not be bound by the orders or decrees in this suit; that as to times of asserted priorities, there is not a general or common claim or defense of citizens or residents of Colorado on which the state of Colorado might represent such parties in this suit, but there are many separate and various claims or defenses.

POINTS AND AUTHORITIES.

I.

The state of Colorado represents its citizens or residents, irrigators in Colorado as *parens patriæ* only in matters of common interest to such irrigators.

New Hampshire v. Louisiana and *New York v. Louisiana*, 108 U. S. 76; 27 L. Ed. 656.

Louisiana v. Texas, 176 U. S. 1, 16; 44 L. Ed. 347.

Missouri v. Illinois, 180 U. S. 208, 234, 235, 240; 45 L. Ed. 497, 509, 510, 512.

Kansas v. United States, 204 U. S. 331; 51 L. Ed. 510.

Oklahoma v. Atchison, Topeka & Santa Fe Ry. Co., 220 U. S. 277; 65 L. Ed. 465.

Massachusetts v. Mellon, 262 U. S. 447, 481, 482; 67 L. Ed. 1078.

North Dakota v. Minnesota, 263 U. S. 365, 374-376; 68 L. Ed. 342, 345, 346.

II.

The state of Colorado does not represent its citizens or residents, irrigators in Colorado, on questions of priority of appropriation of water dependent on different facts.

California v. Southern Pacific Railroad Company, 157 U. S. 229, 256; 39 L. Ed. 683.

New Orleans Water Works Company v. New Orleans, 164 U. S. 471, 480; 41 L. Ed. 518, 523.

Minnesota v. Northern Securities Company, 184 U. S. 199, 246, 247; 46 L. Ed. 499, 520.

Pennsylvania v. West Virginia and *Ohio v. West Virginia*, 262 U. S. 553, 595, 616, 617; 67 L. Ed. 1117, 1131, 1140, 1141.

III.

In the case of *Wyoming v. Colorado*, the irrigators in Wyoming were affected in the same way. Their interests were in common and Wyoming properly represented them.

Wyoming v. Colorado, 259 U. S. 419; 66 L. Ed. 999.

ARGUMENT.

There are two aspects of the claims and of the duties of the 166 Colorado irrigators referred to. So far as the claims and the conduct of the Colorado irrigators are in common with all of the residents or citizens of Colorado who take water from the Arkansas river or its tributaries in Colorado for the irrigation of land in that state it may be conceded that Colorado represents those irrigators in this case and that they will be bound by any orders or decrees made in this case. With respect, however, to the controversies as to priorities in claims or rights of water appropriation between the Finney County Water Users' Association and the owners of other Kansas ditches who take water for the purpose of irrigating land from the Arkansas river in Kansas, and the 166 persons referred to who take water from the Arkansas river or its tributaries in Colorado for the purpose of irrigating land in that state, the controversies necessarily relate to different times of initiation of claims of the Colorado irrigators; the evidence must vary and there is nothing in common between the Colorado irrigators, and the controversies being of a private and several character, the state of Colorado cannot be deemed to represent them so that they will be bound by any orders or decrees in this case.

Equity rule No. 38 provides: "When the question is one of common or general interest to many persons constituting a class so numerous as to make it impracticable to bring them all before the court, one or more may sue or defend for the whole."

The questions of priorities are not of common or general interest. They are specific and separate as between the Finney County Water Users' Association and the owners of the other Kansas ditches and each of the Colorado irrigators referred to.

On these questions of priorities the state of Colorado does not represent the Colorado irrigators as *parens patriæ*, for the same reason that one party cannot represent others under equity rule No. 38; that is, the questions are not of common and general interest, but are of private, separate and varying property rights.

New Hampshire v. Louisiana and *New York v. Louisiana*, 108 U. S. 76; 27 L. Ed. 656.

Louisiana v. Texas, 176 U. S. 1, 16; 44 L. Ed. 347.

Missouri v. Illinois, 180 U. S. 208, 234, 235, 240; 45 L. Ed. 497, 509, 510, 512.

Kansas v. United States, 204 U. S. 331; 51 L. Ed. 510.

Oklahoma v. Atchison, Topeka & Santa Fe Ry. Co., 220 U. S. 277; 65 L. Ed. 465.

Massachusetts v. Mellon, 262 U. S. 447, 481, 482; 67 L. Ed. 1078.

North Dakota v. Minnesota, 263 U. S. 365, 374-376; 68 L. Ed. 342, 345, 346.

We do not contend that this court does not have jurisdiction in this original suit to pass upon the relative claims for appropriations based upon varying facts of irrigators in Kansas and in Colorado respectively. There are broad and general questions as to the use of water in the Arkansas river and of water in its tributaries in Colorado, on which each state represents its citizens and residents, which affect all of the irrigators in each of those states and which cannot be properly disposed of without passing upon the relative and varying claims of these irrigators. This court, having jurisdiction of the general questions between the states which affect these irrigators, should, in order to give adequate relief in the case, pass upon the questions of priorities as between these irrigators. Our purpose in citing the foregoing cases on the question of jurisdiction of this court in original suits brought by states is only to support our position that the state of Colorado does not represent its irrigators upon these private and varying questions, and therefore, they should be made parties defendant in this suit.

Under equity rule No. 37 these Colorado irrigators may be parties because their presence is "necessary . . . . to a complete determination of the cause."

On these questions of priorities the Colorado irrigators are indispensable parties and without their being made parties to the suit or their filing the written statement mentioned, they would not be bound by the orders or decrees so far as the same would relate to private priorities dependent on different facts.

In the case of *California v. Southern Pacific Railroad Company*, 157 U. S. 229, 256, 39 L. Ed. 683, the state of California brought a suit, asserting title to some land as having been under navigable water. The city of Oakland and the Oakland Water Front Company each asserted some rights to the land in controversy. It was held that they were indispensable parties.

In the case of *New Orleans Water Works Company v. New Orleans*, 164 U. S. 471, 480; 41 L. Ed. 518, 523, the waterworks company brought a suit asserting the exclusive right under an ordinance of New Orleans to furnish water to supply the city and its inhabitants. Other parties had been granted, by ordinance of the city, the privilege to lay pipes in its streets for the purpose of conveying water to their respective premises from the Mississippi river. They were held to be indispensable parties.

In the case of *Minnesota v. Northern Securities Company*, 184 U. S. 199, 246, 247; 46 L. Ed. 499, 520, the state of Minnesota brought a suit to prevent by injunction a corporation, organized under the laws of another state, from obtaining and exercising ownership of stock in order to control two competing railroad corporations of Minnesota. It was held that those two railroad corporations were indispensable parties.

In the cases of *Pennsylvania v. West Virginia* and *Ohio v. West Virginia*, 262 U. S. 553, 595, 616, 617; 67 L. Ed. 1117, 1131, 1140, 1141, the commonwealth of Pennsylvania and the state of Ohio brought a suit in this court to enjoin the state of West Virginia "from enforcing a statute designed to preserve natural gas produced in the latter state for use of its own citizens." Mr. Justice Brandeis, in a dissenting opinion, 262 U. S. 616, 617, considered that there was a lack of necessary parties, because twelve exporting companies, having plants and pipe lines located in West Virginia, some of whose pipe lines extended into the territory of the complaining states, and which exported gas to Pennsylvania and Ohio, and fifty-five companies having gas pipe lines in West Virginia and which delivered in that state gas to exporting companies, destined to be transported to the territory of one of the complaining states, were not made parties, and that they were not represented by either of the plaintiffs or by the defendant.

The court held, opinion by Mr. Justice Van Devanter, that the presence of those companies in this suit was not essential. The opinion stated:

> "The third question is whether the requisite parties have been brought into the suits. It is objected that the pipe line companies have not been brought in. But there is nothing which makes their presence essential. The complainant states make no complaint and seek no relief against them. They are supplying gas in those states and evidently will continue to do so, if not restrained or prevented by the defendant state. It is only with her that the complainant states are in controversy. It also is objected that the consumers in the defendant state who will be benefited if the act is enforced have no representation in the suits. But this is a misconception. They are represented by that state, and there is nothing in the situation requiring that they be specially represented or brought in. With equal basis it could be objected in a suit to prevent the enforcement of a

statute reducing railroad freight rates, or in one to prevent the enforcement of a municipal ordinance reducing telephone or electric light rates, that shippers or users who would be benefited by the reduction must be specially represented or brought in. Such an objection would, of course, be untenable; and so of the objection here." (262 U. S. l. c. 595.)

In this case the state of Kansas and The Finney County Water Users' Association seek affirmative relief against the Colorado irrigators. The state of Kansas charges that those parties have taken and threaten to take water from the Arkansas river and its tributaries in Colorado to the injury, not only generally of its citizens and residents of Kansas in the Arkansas valley, but also in violation of the separate prior rights to water appropriation of the Finney County Water Users' Association and various owners of ditches for irrigation of land in the Arkansas valley in Kansas. The Finney County Water Users' Association claims that it has prior rights of appropriation, to the Colorado irrigators.

In the case of *Wyoming v. Colorado*, 259 U. S. 419, 66 L. Ed. 999, the state of Wyoming brough an original suit in this court against the state of Colorado, the Greely-Poudre Irrigation District and the Laramie-Poudre Reservoirs and Irrigation Company, the last two named defendants being corporations of Colorado. Wyoming charged that the two Colorado corporations, under the asserted authority and the permission of Colorado, were proceeding to divert in Colorado a large portion of the water of the Laramie river, which river had its source in Colorado and flowed into Wyoming and there joined the North Platte river; and that this attempted diversion was to be made to another water shed in Colorado for the use of irrigating lands in such other water shed.

The answers of Colorado asserted that Colorado as a state had a right to authorize this diversion without regard to the prejudice

that it might work to Wyoming and its citizens, that Colorado was entitled to an equitable division of the water of the river and that the proposed diversion, together with all subsisting appropriations in Colorado, did not exceed her share, and that after the proposed diversion, there would be left in the Laramie river and its tributaries in Wyoming, sufficient water to satisfy all appropriations in that state whose origin was prior in time to the effective inception of the right under which the proposed Colorado diversion was about to be made. 259 U. S. l. c. 455-457.

In that case there was no controversy as to priorities between an appropriator or appropriators in Wyoming and the two corporations of Colorado operating in that state. It was plain that the appropriations by the Wyoming irrigators had been made before the beginning of the operations complained of in Colorado. So far as the appropriators in Wyoming were concerned their interests were of a common and general kind as against the proposed diversion of the water of the Laramie river in Colorado and for that reason their interests could have been properly represented by Wyoming and they could, therefore, be bound by the decree in the case.

In the case at bar, as above stated, there is no such common question as between the Finney County Water Users' Association and the other Kansas irrigators, on the one hand, and the Colorado irrigators on the other hand, but there are many different questions of private priorities upon varying facts.

For the reasons suggested, we submit that the order should be made which is prayed for in the motion and which was also asked in the prayer of the answers for the state of Kansas and the Finney County Water Users' Association, and the Colorado irrigators should be required and notified either to file in this Court a document of authorization for Colorado to represent them, stating that they will

be bound by the orders and decrees therein, or else they should be made parties to this suit and subpoenas in chancery be issued accordingly against them to bring them in as parties defendant.

Respectfully submitted,

WILLIAM A. SMITH,
Attorney-general of the state of Kansas,

JOHN G. EGAN,
Asst. Attorney-general of the state of Kansas,

CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association.

12-7080

FILE COPY

MAY 15 1931

No. [redacted], ORIGINAL. [redacted] 9976

In the Supreme Court

of the United States

OCTOBER TERM, 1928.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

MOTION FOR LEAVE TO INTRODUCE THE EVIDENCE OF A. J. ABBOTT AND JAMES CRAIG, TAKEN IN A PRIOR CASE.

ROLAND BOYNTON,
JOHN G. EGAN,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

13-8168

In the Supreme Court

of the United States

OCTOBER TERM, 1928.

No. 13, ORIGINAL.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

MOTION FOR LEAVE TO INTRODUCE THE EVIDENCE OF A. J. ABBOTT AND JAMES CRAIG, TAKEN IN A PRIOR CASE.

Come now, the defendants above named and show to the court:

I.

That one of the objects sought in the complainant's bill of complaint is to prohibit and enjoin the further prosecution of a certain action pending in the United States district court for the district of Colorado in which the defendant the Finney County Water Users' Association is plaintiff, and the Graham Ditch Company *et al.* are defendants, the said defendants being irrigators taking water in Colorado from the Arkansas river and its tributaries. That the said case is at issue, and a large volume of evidence has been taken in the said cause bearing upon the issues of whether Colorado has a right to take all of the water in the Arkansas river and whether the said Finney County Water Users' Association can assert and maintain its claimed priority or diversion from the Arkansas river as against the Colorado irrigators. That the same

issues are raised and involved here in the plaintiff's bill and the counterclaim of the state of Kansas, and the said Finney County Water Users' Association.

II.

That a large amount of testimony was taken by the Finney County Water Users' Association in the above-mentioned case, and among others the evidence of Hon. A. J. Abbott, who was formerly judge of the district court of the district in which the Kansas irrigation ditches are situated. Judge Abbott testified as to early-day irrigation in Kansas, the supply of water, its depletion, and particularly as to the facts regarding the knowledge of Kansas irrigators of their rights, and that these irrigators were doubtful and uncertain as to whether they could maintain their priority of irrigation as against the Colorado irrigators, and the fact that they were advised by what they deemed competent authorities that they could not. This particular evidence will go to the question of laches on the part of the Kansas irrigators. The deposition of Judge Abbott was taken at Santa Fe, N. Mex., on the 17th day of February, 1923. That the Hon. Fred A. Sabin, of Pueblo, Colo., who is now counsel for the complainant in this case, was counsel for the defendants in the above-mentioned case, appeared and cross-examined Judge Abbott. That Judge Abbott died three years ago and there is no living witness who can testify to all of the facts which were particularly within Judge Abbott's knowledge and recollection.

III.

That at the hearing in this case at Garden City, Kan., on the 29th day of September, 1930, the defendants then taking testimony on their behalf, at which hearing the Hon. Fred A. Sabin appeared as counsel for the complainant, these defendants offered a copy of the deposition of Judge Abbott so as aforesaid taken, together with

proof of his death, and at the same time offered to admit any part or all of Mr. Sabin's cross-examination of Judge Abbott as part of the record in this case, to which offer the complainant by its counsel objected. That the evidence is being taken by stenographic commissioner, who is without authority to rule upon said objection, and these defendants now desire a ruling of this court upon the admissibility of this testimony into this record before they close the taking of their evidence.

That the bill of complaint in this case is in effect brought on behalf of the same parties who were defendants in the above-mentioned case. That they can suffer no injury by the admission of Judge Abbott's testimony in this case as they have had a full opportunity to cross-examine him. That the Finney County Water Users' Association closed its testimony in 1926. That the defendants therein delayed nearly two years, without taking any testimony, on the plea that they were preparing to file the bill of complaint herein. That this delay, and the necessary delay of this case, has deprived these defendants of Judge Abbott's testimony, and their rights will be seriously and injuriously affected if they are deprived of the use of this deposition in the present case; and these defendants respectfully move and request a ruling and order of this court upon the admission of Judge Abbott's deposition, and the objection of the complainant thereto; that the said objection be overruled, and the evidence of Judge Abbott be admitted into this record with the same force and effect and subject to the same objections as though herein taken.

IV.

These defendants further show to the court that one James Craig was a material and important witness for the Finney County Water Users' Association in its suit against the Graham Ditch Company

et al., and his deposition was duly taken in the said cause at Los Angeles, Cal., on the 12th day of February, 1923; that at the taking of the said deposition the Hon. Fred A. Sabin appeared as counsel for the defendants therein and cross-examined the said Craig, in the case of the *Finney County Water Users' Association v. The Graham Ditch Company et al.* That the said James Craig superintended the construction of the Finney County Water Users' irrigation ditch, beginning in 1880, and had charge of it for some years. He is the only living witness that can testify as to the exact date of the commencement of construction of said ditch, its completion, the date the water was put to beneficial use, the termination and general character of the ditch, and the volume it could carry and did carry at that time. That the said James Craig has testified in these various controversies between Colorado and Kansas several times. He resides at Gridley, Cal., and is now 78 or 79 years old. That he has refused, on account of his health, to testify in this case. That if the defendant, the Finney County Water Users' Association, is deprived of his testimony it will be very injurious to the rights of the said defendant, and the admission of said testimony will be of no possible injury to the complainant as the most of the Colorado parties affected by this litigation were the defendants in the case of *Finney County Water Users' Association v. The Graham Ditch Company* and had full opportunity to cross-examine. That the defendants offered the deposition of the said James Craig so aforesaid taken at Los Angeles, Cal., at the taking of the defendant's testimony in Garden City, Kan., on the 30th day of September, 1930. That counsel for the complainant, Hon. Fred A. Sabin, who appeared at the said taking on behalf of the complainant, objected to the admission of said deposition.

That the defendants offered only the first twenty-five pages of the said deposition, which covers and is confined to the facts above set forth. That the defendants offered to place in the record, if desired by complainant, all of the said Craig's testimony, including any and all parts of the cross-examination, which offer was refused. That unless this deposition is admitted to the record in this case, and the objection of the complainant overruled, it will be necessary to attempt to take the testimony of the said James Craig, involving the necessity of counsel for the complainant, these defendants and the state of Kansas, to travel 1,500 miles, at an expense of many hundreds of dollars, to procure and bring into the record exactly the same evidence which is now offered in this deposition, and with the same opportunity for Mr. Sabin to cross-examine them he has already had in the taking of said deposition. That it would require a compulsory process of this court to compel the said James Craig to testify, and that it is extremely doubtful, considering his advanced age and state of his health, whether he could give his testimony without serious detriment to his health.

These defendants respectfully request a ruling and order of this court upon the profert of the testimony of the said James Craig and the objection of the complainant thereto, that the said objection be overruled, and the said testimony of James Craig be admitted and placed in the record in this case with the same force and effect as though taken herein, subject to the same objections as could be made if so taken.

That the defendants have deposited with the clerk of this court the transcript of the testimony of Judge Abbott offered at Garden City, which will be found on page 921 of said transcript, and also the transcript of the evidence of James Craig offered at Garden City, which will be found on page 1,148 of said transcript, for the

examination of the court, if it desire to substantiate the facts set forth in this motion.

All of which is respectfully submitted,

ROLAND BOYNTON,
JOHN G. EGAN,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

(Original verified)

FILE COPY

MAY 15 1931

No. [redacted] ORIGINAL. [redacted] 976

In the Supreme Court

of the United States

OCTOBER TERM, 1928.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

BRIEF IN SUPPORT OF MOTION FOR LEAVE TO INTRODUCE THE EVIDENCE OF A. J. ABBOTT AND JAMES CRAIG, TAKEN IN A PRIOR CASE.

ROLAND BOYNTON,
JOHN G. EGAN,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

13-8268

INDEX.

SUBJECTS.

	PAGE
STATEMENT	3
The evidence of A. J. Abbott and James Craig, which had been taken in the suit brought by the Finney County Water Users' Association against various irrigators in Colorado, is admissible in this suit	7
Such evidence by A. J. Abbott, who is now dead, is admissible	11
Such evidence by James Craig, an old witness, who resides in California, and whose testimony it will now be difficult to obtain, is admissible	12

CITATIONS.

Chirac v. Reinecker, 2 Peters 613, 620, 621	7
Kansas v. Colorado, 206 U. S. 46	5
Philadelphia W. & B. R. Co. v. Howard, 13 Howard 307	7
Wyoming v. Colorado, 260 U. S. 1	4
22 Corpus Juris:	
p. 428, secs. 513, 514	7
p. 430, sec. 515	7
p. 431, secs. 516, 517	8
p. 433, sec. 518	8
p. 436, sec. 523	8
3 Wigmore on Evidence, 2d ed., secs. 1387, 1388	9

In the Supreme Court

of the United States

OCTOBER TERM, 1928.

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

No. 13, ORIGINAL.

BRIEF IN SUPPORT OF MOTION FOR LEAVE TO INTRODUCE THE EVIDENCE OF A. J. ABBOTT AND JAMES CRAIG, TAKEN IN A PRIOR CASE.

STATEMENT.

The defendants for their brief in support of their motion to introduce in this case the evidence of A. J. Abbott and James Craig, taken in the case of *The Finney County Water Users' Association v. The Graham Ditch Company et al.*, in the United States district court for the district of Colorado, beg to submit as follows:

1.

The bill of complaint alleges the institution and prosecution of two suits by the defendant, The Finney County Water Users' Association, hereinafter for the sake of brevity designated as defendant Association, in the United States district court for the district of Colorado. The case of the defendant Association against the Graham Ditch Company *et al.*, was instituted in the latter part of 1916 for the purpose of obtaining a priority of its appropriation and

diversion of water from the Arkansas river in Kansas for irrigation purposes, as against a large number of irrigators taking water for the same purpose from the Arkansas river in Colorado. Motion to dismiss for want of equity was filed with the defendants in that case and argued orally. At that time the case of *Wyoming v. Colorado*, original, was pending in this court, involving the right of irrigators in one state to maintain their priority against irrigators on the upper part of the same river, in another state, and Judge Symes kept the case under advisement until it was finally decided (260 U. S. 1) in favor of the right of the lower appropriators to maintain their priority against subsequent appropriators in another state on the upper part of an interstate river.

In 1922 the defendant Association began, in the same court, its suit against the Coler Ditch Company *et al.*, appropriating and diverting water from the tributaries of the Arkansas river. There were about one hundred and fifty defendants in the latter case. Following the decision in *Wyoming v. Colorado*, Judge Symes overruled motions to dismiss each of these cases for want of equity, and the defendants were put to answer. A large amount of testimony was taken in the Graham Ditch Company case. Among others the deposition of Hon. A. J. Abbott was taken at Santa Fe, N. Mex., on the 17th day of February, 1923, and the testimony of James Craig was taken at Los Angeles, Cal., on the 12th day of February, 1923. Counsel who represented these defendants in this litigation were Hon. James Grafton Rogers, now assistant secretary of state, Mr. Fred A. Sabin, of Pueblo, and Mr. A. Watson McHendrie, of Trinidad, Colo. Mr. Sabin, as counsel for the defendant, appeared and cross-examined both of the witnesses above named.

II.

At the close of the taking of plaintiff's testimony in the Graham Ditch Company case in July, 1926, counsel for the defendants announced that they did not expect to take any testimony for the defendants in that case; that they were planning to have a suit brought by the state of Colorado covering the whole controversy; and the same counsel in connection with the then attorney-general of the state of Colorado, having secured permission to bring such suit, did institute this suit in this court. The purpose of this action is to prohibit and enjoin the defendant Association from further prosecuting the two suits above described and from making any claim whatever under its alleged right of appropriation, and to enjoin the state of Kansas and all of its citizens from further instituting any suits against the diversions of the water of the Arkansas river in Colorado, and in effect to quiet the title claimed by all of the irrigators of the Arkansas river basin in Colorado to all of the flow of the said river. There are other allegations as to numerous suits brought, but the purpose of the action is to determine the rights of the irrigators in Colorado as against the irrigators in Kansas, and to further determine the right of the citizens of the two states to the flow of this river.

III.

The state of Colorado in this suit appears as *parens patriæ* as was done by the state of Kansas in *Kansas v. Colorado* (206 U. S. 46). It appears in a representative capacity for the defendants who were impleaded by the defendant Association in the Graham Ditch case. The issues in effect are the same, although it is probably true that in the two cases above mentioned not all of the irrigators of the Arkansas river basin in Colorado were impleaded, but they are in the same class and related in the same way to the rights sought to be determined in this case.

IV.

After the issues were made up in this case the defendants here moved the court to make as additional party defendants the defendants in both of the two cases above mentioned, the Graham Ditch Company case and the Coler Ditch Company case. This motion was denied. No opinion was filed, but we are bound to assume that the motion was denied on the ground that these defendants were not necessary parties in this case; that they are in the case by representation, representation by the state of Colorado, which claims that under the constitution and laws of Colorado all flowing water in that state is public water and belongs to the state; and that it can only be appropriated, diverted and applied to beneficial use under the laws and regulations of the state of Colorado, and under the control and supervision of its administrative officers duly appointed for that purpose. Our understanding of the view of this court is that a decree in favor of or against the complainant would bind all of the irrigators in Colorado above described as effectively as though they were made parties defendant herein. This point is important and determinative of the issues raised by this motion.

V.

The motion seeks to introduce, offer and have admitted into the evidence in this case the deposition of A. J. Abbott, now deceased, and of James Craig, now a man of advanced years, who has refused because of that fact to again testify in this case. The point involved is whether this testimony taken in the Graham Ditch case may be introduced here with the same force and effect as though both witnesses were living and capable of testifying at this time. We proceed to the law in the matter.

VI.

The proposition advanced here is by no means novel. It has been before the courts many times, and there is a wealth of legal learning on it. There is an extensive discussion of that subject in 22 C. J., beginning on page 428, section 511, with a great number of citations. From this we give the following essentials necessary to the admission of the former evidence of witnesses in a subsequent trial.

(a) Identity of issue.

22 C. J. 430, sec. 515.

The issues in a former case must be practically the same as those in the subsequent trial, although the testimony need not apply to all of the issues, nor have like effect as to all of the defendants. It needs no argument to show such identity here, because it is alleged on the face of the bill of complaint that the issues in the case at bar, or nearly all of them, are identical with the issues in the Graham Ditch Company case.

(b) Identity of parties.

22 C. J. 428, secs. 513, 514.

It is not necessary that the litigation should be between the same parties. The word "parties" as here used is given a very broad significance. It includes not only the same parties, but representative officers in interest and privies of the parties in the original litigation.

In *Philadelphia W. & B. R. Co. v. Howard*, 13 Howard 307, this court held that evidence against a corporate defendant might be used against another corporation which had been formed by the consolidation of the defendant in a former case, and two other corporations.

We submit that the principle we contend for was declared in *Chirac v. Reinecker*, 2 Peters 613, 620, 621.

(c) Opportunity for cross-examination.

22 C. J. 431, sec. 516.

The fact that counsel for the opposing party had an opportunity to cross-examine the absent witness is most persuasive for the admission of such witness' testimony in a subsequent trial. In this case the testimony of these two witnesses was not taken *ex parte*, but upon notice. Mr. Sabin, attorney for complainant here, was attorney for the defendants there, and cross-examined Abbott and Craig at considerable length. If the two witnesses were able to testify at this trial, undoubtedly the evidence in chief would be exactly the same and the cross-examination would be the same.

(d) Death of witness.

22 C. J. 433, sec. 518.

This is a compelling cause for the admission of the testimony of a witness at a former trial because his evidence, of course, is not now procurable. This applies to Judge Abbott, who died three years ago.

(e) Inability to attend.

22 C. J. 436, sec. 523.

Inability of the witness to attend, by reason of age or illness, is another of the excuses for his nonproduction and the secondary use of his former evidence.

(f) Excuses for nonproduction of witness.

22 C. J. 431, sec. 517.

Here the discretion of the court is largely controlling, depending on the diligence shown by the party offering the evidence and of the circumstances, such as physical weakness, illness, besides the difficulty of procuring the evidence.

(g) Mr. Wigmore's discussion of the subject.

The principles which should govern the subject are well stated in 3 Wigmore on Evidence, second edition, sections 1387 and 1388. We quote portions of those sections:

"SEC. 1387. *Issue the same.* The *issue* on the occasion when the former testimony or deposition was given must have been substantially the same, for otherwise it cannot be supposed that the former statement was sufficiently tested by cross-examination upon the point now in issue. Conversely, it is sufficient if the issue was the same, or substantially so for the purpose.

"The general rule in this shape is nowhere disputed. But there is naturally much variance shown in the strictness of its application in specific cases. The situation is one that calls for common sense and liberality in the application of the rule, and not a narrow and pedantic illiberality. On the whole, the judicial rulings show a liberal inclination to receive testimony already adequately tested; but there is yet room for much improvement. . . . ."

"SEC. 1388. *Parties or privies the same.* It is commonly said that the *parties* to the litigation in which the testimony was first given *must have been the same* as in the litigation in which it is now offered.

"But this limitation suffers in practice many modifications; and properly so, for it is not a strict and necessary deduction from the principle. At first sight, indeed, it seems fair enough to argue even that a person against whom former testimony is now offered should have to be satisfied with such cross-examination as any other person whatever, in another suit, may have chosen to employ. And it is entirely settled that in some such cases he must be satisfied, namely in cases where the other person was a privy in interest with the present party. The reason for such cases is that there the interest to sift the testimony thoroughly was the same for the other person as for the present person. The principle, then, is that where the interest of the person was calculated to induce equally as thorough a testing by cross-examination, then the present opponent has had adequate protection for the same end. Thus, the requirement of identity of parties is after all only an incident or corollary of the requirement as to identity of issue. It ought, then, to be sufficient to inquire *whether the former testimony was given upon such an issue that the party opponent in that case had the same*

interest and motive in his cross-examination that the present opponent has; and the determination of this ought to be left entirely to the trial-judge.

"Nevertheless the courts have not, in name at least, often gone so far as to accept so broad a principle.

"(1) It is well settled that the former testimony is receivable if the difference of parties consists merely in a difference of *nominal parties* only, or in an addition or subtraction on either side of parties not now concerned with the testimony.

"(2) It is well settled that the former testimony is receivable if the then party opponent, though a different person, had the *same property interest* that the present opponent has." . . .

In this case the state of Colorado has taken up the defense on the part of the defendants in the suit brought by the Finney County Water Users' Association, in the district court of Colorado, and with the consent of those defendants. The result of the pendency of this suit is that the issues presented in the case in the district court of Colorado are being litigated here, and the state of Colorado has taken the place as a party of the defendants in the suit in the district court. It is as much a continuation of the same litigation as if there had been a substitution of parties in a single suit.

The important point of an opportunity to cross-examine the witnesses Abbott and Craig is met by the consideration that Mr. Fred A. Sabin, one of the attorneys in this suit for the state of Colorado, acted as one of the attorneys for the defendant in the suit in the district court, and cross-examined the witnesses Abbott and Craig.

(h) Discretion of the court.

See citations, *supra.*

It is uniformly held that the admission of this secondary evidence is almost entirely within the discretion of the trial court and upon appeal error will not be predicated on such admission, unless it is clearly shown that the discretion of the court was abused.

Every such profert stands upon its own footing and its admission is to be governed by the principles of justice and the wholesome desire to ascertain the truth of the controversy, regardless of technicality. It will be noted that the strictness of the early rules has been very much modified in modern times. Many courts have gone to the extent of permitting a living witness to testify to the substance of the testimony of the dead or absent witness. That question, of course, does not arise here.

VII.

As to the admisibility of the testimony of A. J. Abbott, the dead witness, we are on even stronger grounds. We have brought ourselves within all the requirements. We have offered a literal transcript of the testimony of the witness, we have shown that the issues and the parties are identical, and the witness being dead his evidence cannot be produced; his evidence is material upon many points of the case, and as to the state of mind among the western Kansas irrigators no other witness can give this testimony. Judge Abbott was consulted as a judge of the district court of that district, himself a practical irrigator, on the possibility of the Kansas irrigators maintaining their rights as against the Colorado irrigators. He consulted Hon. Preston B. Plumb, then the United States Senator from Kansas, and a very able lawyer, who was himself interested in irrigation projects, and he gave it as his opinion that the Kansas irrigators could not successfully maintain a suit to enjoin a diversion of the water from the upper part of the river in Colorado, and in fact such right, the right to establish a priority upon the lower reaches of the river as against irrigators on the upper reaches in another state, was probably not definitely decided and established until the decision of this court in *Wyoming v. Colorado*, supra, in 1922.

As one of the law issues in this case will be the laches of the defendant Association and the state of Kansas, this testimony becomes very material. Laches is only imputed where the legal right upon which the party has slept is well settled. It is never imputed where the legal right is uncertain and has never been passed upon by the courts of last resort.

We submit that as to Judge Abbott's testimony the motion should be sustained.

VIII.

As to the testimony of James Craig, we know that it is impossible to bring Craig to Colorado or Kansas to take his testimony, owing to his advanced age. He is not incompetent mentally, so far as we know. We cannot and do not assert that to place him upon the stand, examine him in chief, and cross-examine him would injure his health. We cannot tell from the letter which he wrote us, refusing to testify, whether his refusal is based on danger to his health, physical weakness, or simply a whim of an old man who is tired of testifying in this litigation. He testified in *Kansas v. Colorado*, in United States Irrigating Company v. the same defendants as are impleaded in Graham Ditch Company case, and twice in the Graham Ditch case. He may well be excused if he is tired of testifying over and over again upon the same fact. But we have offered only the first twenty-five pages of his Los Angeles deposition, as shown by the record that is submitted and deposited with the clerk for the court's examination. This evidence is purely formal. We have omitted all his evidence as to the earlier water supply, its diversion in Colorado, and consequent injurious effect upon the Kansas irrigator. We have other and we think sufficient evidence upon this point, but James Craig is the only living witness who can testify to the original character of the defendant Association's ditch. He came to Kansas in 1879; he had had experience in

moving dirt, and he acted as the first superintendent in charge of the construction of this ditch. He testified as to the date of the commencement of this construction in 1880, when it was completed, and the date when the water was first put to beneficial use. He testified as to the intake of the ditch, the removal of the intake later to a point in Kearny county, the width of the ditch, the slope of its banks, its depth, its gradient, and its carrying capacity, and the amount of land that could be irrigated from it. We claim a priority from the beginning of the construction of the ditch. Craig's testimony shows that the construction was continuous until it was completed and the water turned into it.

Counsel for the defendants assert that if this motion is denied and Craig put on the stand his testimony in chief will be exactly like that offered here. His cross-examination will be the same and will throw no other light on the controversy. It will be necessary for counsel for the complainant and the defendants to make a long trip to Gridley, California, and take with them the stenographic commissioner and have him issue his compulsory process to compel Craig to go upon the stand. If he testifies it will be exactly the same evidence that we here desire to have admitted to the record. It might well be, when all of us arrive there, that the condition of his health will be such that he could not testify. Then we should, of course, have to renew this motion. There will be the expense of at least four lawyers, and of the stenographic commissioner and his per diem; probably very close to $1,000, outside of the time of the lawyers.

As to Craig's testimony, we are appealing to expediency rather than the positive ground of the impossibility of procuring his evidence. We are desirous of saving these litigants this sum which would be so uselessly expended.

We contend that no right of the complainant can be injuriously affected by the admission of this testimony.

The ruling desired here is, of course, not of substantive law. It is purely procedural, and it is well settled that as to procedural matters this court, sitting as a trial court, deals with such situations so as to avoid useless expenditure of time, labor and money. It applies established rules with great liberality and, if necessary, it makes new rules for its own government, in the interests of practicability and justice.

Respectfully submitted,

ROLAND BOYNTON,
JOHN G. EGAN,
CHESTER I. LONG,
Solicitors for the State of Kansas.

F. DUMONT SMITH,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for the Finney County Water Users' Association, a Corporation.

13-8268

FILE COPY

No. 11, Original

Office Supreme Court, U. S.
FILED
MAY 25 1931
CHARLES ELMORE CROPLEY
CLERK

In the Supreme Court

of the United States

OCTOBER TERM, 1928

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation,

Defendants.

OBJECTIONS OF COMPLAINANT TO THE FILING OF THE MOTION AND TO THE MOTION FOR LEAVE TO INTRODUCE THE EVIDENCE OF A. J. ABBOTT AND JAMES CRAIG TAKEN IN A PRIOR CASE, AND BRIEF AND ARGUMENT IN SUPPORT THEREOF.

CLARENCE L. IRELAND,
Attorney General of Colorado,
SIDNEY P. GODSMAN,
Assistant Attorney General of Colorado.

FRED A. SABIN,
A. WATSON MCHENDRIE,
HENRY C. VIDAL,
Of Counsel.

INDEX.

SUBJECTS:	Page
Objections to filing of motion for leave to introduce evidence of A. J. Abbott and James Craig, taken in a prior case, and brief and argument in support thereof, and to said motion	3
Statement of Facts	4
Questions Presented	11
Argument	12
Conclusion	17

CITATIONS:	
Hoe v. Scott, 87 Fed. 220	12
Lull v. Clark, 22 Blatchf. 207, 208, 209	12
Swift v. Castle, 23 Ill. 209, 214	14
Bate Refrigerating Co. v. Gillette, 28 Fed. 673, 674	14
Nichol v. McCalister, 52 Ind. 586, 587	14
Williams v. Vreelands, 30 N. J. Eq. 576, 578	14
Supreme Court Rule No. 16	15

In the Supreme Court

of the United States

OCTOBER TERM, 1928

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation,

Defendants.

OBJECTIONS OF COMPLAINANT TO THE FILING OF THE MOTION AND TO THE MOTION FOR LEAVE TO INTRODUCE THE EVIDENCE OF A. J. ABBOTT AND JAMES CRAIG TAKEN IN A PRIOR CASE, AND BRIEF AND ARGUMENT IN SUPPORT THEREOF.

Comes now the complainant herein and objects to the filing of defendants' motion for leave to introduce the evidence of A. J. Abbott and James Craig, taken in a prior case, and brief in support thereof, and objects to the motion itself as follows:

I.

To the filing of said motion and brief:

1. The ruling desired here is one of substantive law and not purely procedural.

2. The motion as presented is not proper procedure.

3. The evidence which defendants are moving to have admitted is already in the transcript of the Commissioner

to take testimony and is not at this time properly before this Honorable Court for consideration.

II.

To the motion for leave to introduce said evidence:

1. This is not the proper time or manner to urge such a motion.

2. Under the present disclosures of the record in this case to now urge that the offers of the evidence of said witnesses in a prior case is competent, relevant and material, as against the objection of counsel for complainant made before the Commissioner to take testimony as shown in the following statement of facts, raises a question of substantive law and not one of procedure.

3. The motion is redundant and surplusage.

WHEREFORE, Complainant moves this Honorable Court that said motion and brief be not filed, or, in the event the said motion and brief are permitted to be filed, that said motion be denied, reserving the ruling on complainant's objections to the admissibility of said testimony until the final consideration of this case.

BRIEF AND ARGUMENT IN SUPPORT OF THE FOREGOING OBJECTIONS.

STATEMENT OF FACTS

Complainant supplements the statement of facts made by defendants in their brief in support of their motion for leave to introduce the evidence of A. J. Abbott and James Craig, taken in a prior case, as follows:

1. That on September 29, 1930, at Garden City, Kansas, before Millen S. Atwood as the Stenographic Commissioner duly commissioned to take testimony in this action, the said deposition of A. J. Abbott taken February 17, 1923,

at Santa Fe, New Mexico, was admitted in evidence by said Commissioner over the objection of this complainant. That said deposition appears in full on pages 925 to 990 inclusive in Volume VII of the transcript of the evidence taken at Garden City, Kansas, September 29, 1930, as prepared by said Commissioner.

2. That the offer in evidence of this deposition on the part of these defendants and the objections to the introduction thereof on the part of this complainant were duly made on September 29, 1930, and the objections appear in said transcript in Volume VII, at pages 921 to 924, inclusive, as follows:

"MR. SMITH: Now, the defendants offer in evidence the deposition of Judge A. J. Abbott, taken at Santa Fe, New Mexico, on the 5th—on the 17th day of February, 1923, in a case pending in the United States District Court of the District of Colorado, in which the defendant, The Finney County Water Users' Association was complainant, and the following named individuals and corporations were defendants: The Graham Ditch Company, a corporation; The Colorado and Kansas Canal and Reservoir Company, a corporation; The Lamar Land and Canal Company, a corporation; The Fort Lyons Canal Company, a corporation; The Oxford Farmers Ditch Company, a corporation; The Rocky Ford Canal, Reservoir, Land, Loan and Trust Company, a corporation; The Catlin Consolidated Canal Company, a corporation; The Rocky Ford Ditch Company, a corporation; The X. Y. Irrigating Ditch Company, a corporation; The Manvil Canal, Reservoir and Improvement Company, a corporation; The Twin Lakes Land and Water Company, a corporation; The Twin Lakes Reservoir Company, a corporation; The Canon City, Florence and Pueblo Water Company, a corporation; The Bessemer Irrigating Ditch Company, a corporation; The Holbrook Irrigation District, a Public Corporation; The Otero Irrigation District, a Public Corporation; The Arkansas Valley Sugar Beet and Irrigated Land Company, a corporation; and Colorado Southern Irrigation Company, a corporation.

"That at the taking of said deposition, Mr. Fred A. Sabin, who is now one of the solicitors for complainant,

was solicifor for all of the defendants named in the said deposition, appeared in their behalf, and cross-examined the said witness.

"That the said Judge A. J. Abbott is now deceased. This being a carbon copy of the original deposition now on file in the office of the Clerk of the United States District Court of Colorado.

"We offer this on the theory that the same issues were involved in that case, and that the witness is now dead, and his testimony cannot be procured.

"MR. SABIN: Colorado objects to the introduction of the deposition offered by Senator Smith, Solicitor for the corporation defendant here, on the ground that the deposition and its contents are irrelevant, incompetent and immaterial, for the following reasons:

"1st. It is not a deposition taken in any proceeding then, or at all, pending between the parties to the proceeding now here on trial.

"2nd. Because the issues involved in the proceedings in which that deposition was taken, were not the same issues involved in the proceeding now here on trial.

"3rd. That this proceeding is one between sovereign states, and involves only matters of state concern, and is not such a proceeding as will permit of the establishment on the part of the corporation defendant in this proceeding, of any date of priority for the Farmers ditch owned by the corporation defendant.

"4th. The deposition offered relates largely, if not exclusively, to dates prior to 1905, being the date or year in which the taking of testimony in the case of Kansas versus Colorado, was closed. Our theory being that conditions prior to 1905, and specifically to the date upon which testimony ceased to be taken in that year, are foreclosed by the decision in the case of Kansas versus Colorado, and those matters there involved became, and are res adjudicata, by reason of which the decision of Kansas versus Colorado is the law of this case with reference to matters which arose prior to 1905.

"The decision in Kansas versus Colorado was a decision between the same litigants, same sovereign states, that are parties to this proceeding, and the court there determined that, as shown by the record in that case, there had been up to the time the taking of testimony in that case ceased, no such infringement by Colorado upon the rights

of Kansas, and in fact that there had been no infringement at that time which would justify the maintenance of the Bill of Kansas filed in Kansas versus Colorado, and that consequently the court dismissed the bill, with the statement in the opinion that if at any time in the future, Colorado should impinge upon the rights of Kansas, to the extent that such impingement would amount to an encroachment upon the equitable rights of Kansas to the waters of the Arkansas river, Kansas might come back and set up such facts. The position of Colorado, therefore, is that only matters arising since that decision, which we take to be res adjudicata and controlling upon the parties hereto on the conditions existing up to the time of the ceasing of the taking of testimony in Kansas versus Colorado, can be gone into in this proceeding. Always reserving to Colorado, however, the right in this proceeding to object to any testimony subsequent to 1905, on the ground that this proceeding should be limited to the prayer in the original bill of complaint herein, which deals only with enjoining or prohibiting certain litigation pending in the United State District Court for the District of Colorado between citizens of Colorado and citizens of Kansas.

"No objection is made to the offer, on the ground that the document offered, is merely a carbon copy of the original.

"MR. EGAN: The state of Kansas also offers this deposition of Mr. Abbott in evidence, and represents that the issues involved in the case in which that deposition was taken, are, by virtue of the bill of the state of Colorado, and of the answer of the state of Kansas, brought into this case, on the theory advanced by the State of Colorado that it represents in this case the water appropriators and ditch owners in Colorado.

"MR. SABIN: Colorado objects to the offer on behalf of the state of Kansas, upon the ground that the deposition offered is incompetent, irrelevant and immaterial, for the same reasons and upon the same grounds that it set forth in the record as grounds for the objection to the offer by the defendant, The Finney County Water Users' Association."

3. That on September 30, 1930, at Garden City, Kansas, before said Commissioner the said deposition of James

Craig taken February 12, 1923, at Los Angeles, California, was likewise admitted in evidence over the objection of this complainant. That said deposition or so much thereof as defendants offered appears in full on pages 1151 to 1171, inclusive, in Volume VIII of said transcript of September 30, 1930.

4. That the offer in evidence of this deposition on the part of these defendants and the objections to the introduction thereof on the part of this complainant were duly made on September 30, 1930, and the objections appear in said transcript in Volume VIII at pages 1148 to 1150, inclusive, as follows:

"MR. SMITH: The defendants now offer in evidence the first twenty-six pages of the transcript, which I now hand to the Commissioner for identification (marked Kansas' Exhibit 6), being a part of the deposition of James Craig, taken at Los Angeles, California, on the 12th day of February, 1923, in the case of The Finney County Water Users' Association, pending in the United States District Court for the District of Colorado, against the same defendants as were named in the deposition of Judge A. J. Abbott, offered in evidence yesterday. James Craig had charge of the construction of the Farmers' ditch. These twenty-six pages constitute his testimony with reference to the construction of that ditch, the date it commenced, size and carrying capacity of the ditch, the number of laterals that were constructed, the amount of land under the ditch capable of irrigation, and other details concerning the construction of the ditch, and nothing more.

"I also want the record to show that Mr. Fred A. Sabin, who is now solicitor for the complainant in this case, was solicitor for the defendants in the case of The Finney County Water Users' Association vs. The Graham Ditch Company, and others, appeared at this hearing and cross-examined this witness.

"MR. SABIN: You mean, at the hearing in 1923?

"MR. SMITH: Yes.

"MR. SABIN: Colorado objects to the offer of Kansas Exhibit six, for the reason that it is incompetent, irrelevant and immaterial, on the following grounds:

"FIRST: It is a deposition taken in another proceeding, not between the parties to this action, or suit.

"SECOND: That it relates to litigation between private citizens, and not between sovereign states.

"THIRD: That the issues involved in the present pending litigation in which this exhibit is offered, are matters of state concern, and not of private concern.

"FOURTH: This offered exhibit does not contain anything touching the issues, or any of them, involved in the present pending case in which it is offered, and does not prove or tend to disprove anything either for or against either party.

"FIFTH: The exhibit offered is only a portion of the testimony of the witness, Craig; and the offer omits 125 pages of the testimony of the witness, Craig, given at the time of the taking of the deposition in 1923, as shown by the copy of the deposition offered in evidence, and marked.

"SIXTH: Colorado further objects to the proffered exhibit, on the ground that the matters and things testified to by the witness, Craig, as shown by the copy of this deposition, offered, are matters which occurred prior to the closing of the taking of testimony in the case of Kansas versus Colorado, in 1905, and this objection being predicated upon the ground that all of those matters were foreclosed by the decision of the Supreme Court of the United States in the case of Kansas versus Colorado, decided in 1907. All of those matters, as we contend, being res adjudicata, and binding upon the parties to his case. We wish this particular ground of objection to be considered as including the objections made by counsel for Colorado this morning to the testimony of the witnesses, Simpson, McClurkin and Hurst.

"SEVENTH: No objection—. No showing is made by Kansas of any reason why this witness is not within the jurisdiction of this Court, and cannot be produced here to testify.

"This objection does not go to the character of the exhibit, itself, as being a mere copy instead of being a certified and authenticated copy."

5. That when all of the evidence is taken and this case is before this Honorable Court for final determination of

all of the issues of fact and of law said transcript containing both of said depositions and the respective offers and objections to the introduction thereof will be a part of the record for the then timely consideration.

6. That these depositions were offered in evidence before said commissioner by these defendants and even though the same are now a part of the transcript of such commissioner these defendants are asking this Honorable Court to now rule piecemeal on the admissibility of their own offer prior to the conclusion of the taking of testimony before said commissioner and prior to the final consideration of the whole case.

7. That the said A. J. Abbott died since his said deposition was taken; that the defendants admit "there is no living witness who can testify to all of the facts which were particularly within Judge Abbott's knowledge and recollection." (Page 2, Motion to Introduce Testimony.)

8. That defendants admit that "James Craig is the only living witness who can testify to the original character of the defendant Association's ditch. He came to Kansas in 1879; he had had experience in moving dirt, and he acted as the first superintendent in charge of the construction of this ditch. He testified as to the date of the commencement of this construction in 1880, when it was completed, and the date when the water was first put to beneficial use. He testified as to the intake of the ditch, the removal of the intake later to a point in Kearny county, the width of the ditch, the slope of its banks, its depth, its gradient, and its carrying capacity, and the amount of land that could be irrigated from it. *We claim a priority from the beginning of the construction of the ditch.* Craig's testimony shows that the construction was continuous until it was completed and the water turned into it. (Italic ours.)

"Counsel for the defendants assert that if this motion

is denied and Craig put on the stand his testimony in chief will be exactly like that offered here. His cross-examination will be the same and will throw no other light on the controversy." (Pages 12, 13, Brief in Support of Motion to Introduce Testimony.)

9. That complainant admits that were the deposition of the said James Craig now to be taken his testimony would be substantially the same as in his deposition now offered.

10. The defendants are now in no different position than they would be if the said offers of September 29 and 30, 1930, which were introduced over the said objections of complainant, were the offers of the testimony of the witnesses A. J. Abbott and James Craig in person before said Commissioner testifying to the same facts as stated in said depositions with the same objections of complainant made thereto.

11. The only effect of the ruling now sought by the defendants is to have the admissibility of the evidence here in question determined prior to the completion of the taking of testimony before the Commissioner and the final presentation and consideration of the case as a matter of substantive law and not as a matter of procedure.

12. That the defendants admit the rule which they are here seeking "is purely procedural." (Page 14, Brief in Support of Motion to Introduce Testimony.)

QUESTIONS PRESENTED.

I. Is the motion of defendants proper or necessary procedure at this stage of the case?

II. Is the rule which defendants are now seeking "purely procedural"?

ARGUMENT.

I.

1. THE MOTION IS NOT PROPER FOR

(a) It is irregular and is not sustained by authority or the practice of the court as is admitted by defendants in the last sentence of their brief. (Page 14.)

(b) The courts generally do not recognize any such procedure.

"The application now is that the court shall give its directions to the master to refuse to take evidence * * *. This does not seem to me to be in accordance with precedent or proper practice. The court appoints the master with special reference to his fitness to perform the duties imposed upon him. He is the court's representative, and it is his duty to pass upon all the questions of procedure as they come before him. His action is subject to review of the court, *but it must be only when he has concluded his labors, and the court has before it all the data* upon which his conclusions are founded. The duty of the master is to hear the parties fully, 'directing the mode in which the matters requiring evidence shall be proved before him,' as provided for in the seventy-seventh rule in equity. It is necessary that he should be given the power to avoid delays and confusion, and to relieve the court of the necessity of passing upon the materiality of every disputed question as it may arise in the progress of the hearing. Errors made by the master can be corrected upon the coming in of his report upon exceptions properly taken." (Italics ours.)

Hoe, et al. v. Scott, 87 Fed. 220.

Again we read:

"This is a motion to instruct the master in an equity action. * * * This objection was sustained by the master, and complainant's counsel excepted, and immediately gave notice of a motion for an order directing and instructing the master to take and state, and report to the Court, an account covering all the hinges referred to. *A certified copy of the proceedings before the master is presented upon this motion. But the master has made no report and has not sought instruction or advice from the Court.*

"The first objection interposed by the defendants is, that this application is irregular, and is not sustained by authority or the practice of the Court. I am of the opinion that the objection is well taken. Rule 77 gives the master very general discretion in the conduct of the investigation before him. He occupies, for the time being, the position of the Court, and is not to be continually interfered with, while discharging his duties to the best of his ability. *It would create intolerable delays and confusion, besides putting an unnecessary burden upon the Court, to hold, that each time the master makes a ruling the aggrieved party may, by special motion, have it reviewed.* The orderly, and, it seems, the generally accepted, procedure is, to present all the qustions arising before the master by objections and exceptions to his report.

"Let it be assumed that the direction asked for is within the discretion of the Court. It has not been customary to exercise it, and, in my judgment, it ought not to be exercised in a case like the present, where the master simply makes a ruling which he has an undoubted right to make. A decision for the complainant will be recorded for a precedent, and the attention of the Court continually occupied with similar applications. A simple and well understood system will thus be involved in confusion and uncertainty. The weight of authority sustains the view here taken." (Citing cases.) (Italics ours.)

Lull v. Clark, 22 Blatch. 207, 208, 209.

In the instant case all of the evidence is not yet taken and the whole transcript cannot be considered by the court. Nor, to our knowledge at least, has the stenographic commissioner submitted any of the transcript nor "sought instruction or advice from the court." Opposing counsel state:

"That the *defendants have deposited with the clerk of this court* the transcript of the testimony of Judge Abbott offered at Garden City, which will be found on page 921 of said transcript, and also the transcript of the evidence of James Craig offered at Garden City, which will be found on page 1148 of said transcript, for the examination of the court, if it desire to substantiate the facts set forth in this motion." (Italics ours.) (Page 5 of said motion.)

Under this state of facts the language of the Lull v. Clark case, *supra*, might well be adapted to the present case as follows:

"It would create intolerable delays and confusion, besides putting an unnecessary burden upon the court, to hold, that each time the Stenographic Commissioner included an offer of testimony, the objections thereto, and the particular evidence there in question, in his transcript the aggrieved party (here the party *offering* the testimony), may, by special motion, have its admissibility decided. The orderly, and, it seems, the generally accepted, procedure is, to present all the questions arising before the Stenographic Commissioner by objections made at the time and so appearing in his report or transcript."

The Supreme Court of Illinois stated this same principle regarding depositions in equity cases.

"When the party conceives that there is any irregularity or informality in taking the proofs, he may move to suppress depositions, and if the exceptions are overruled, he may except, but all questions as to the pertinency of evidence may be, and usually are, reserved to the hearing."

Swift, et al. v. Castle, 23 Ill. 209, 214.

See also:

Bate Refrigerating Co. v. Gillette, 28 Fed. 673, 674;

Nichol v. McCalister, 52 Ind. 586, 587;

Williams v. Vreelands, 30 N. J. Eq. 576, 578.

This question generally arises where there is a motion to "suppress" depositions or testimony. But in the instant case the motion of defendants attempts to "impress" the deposition. We adopt the word "impress" for the sake of clarity. We submit that the reasoning of these cases deferring the rule until final hearing on a motion to "suppress" applies *a fortiori* on a motion by the party offering evidence to "impress" the same before final hearing. Defendants should be satisfied with their own present offer of testimony at the final hearing, especially when they show

that they cannot produce any other on the point covered by the offer.

(c) Since there is no Supreme Court rule directly controlling this procedure in an original proceeding, we submit that the rule most analogous in the appellate practice should control. Supreme Court Rule No. 16 provides:

"In all cases of equity or admiralty jurisdiction, heard in this court, no objection to the admissibility of any deposition, deed, grant, or other exhibit found in the record as evidence shall be entertained, unless such objection was taken in the court below and entered of record. Where objection was not so taken the evidence shall be deemed to have been admitted by consent."

That the requirements of this Honorable Court in this analogous rule have been met is clear from the above statements of fact 1 to 5, inclusive.

2. THAT THE MOTION IS UNNECESSARY, FOR

It is obvious, since defendants already have the offered testimony in the record of the Stenographic Commissioner so that its admissibility can be determined by this Honorable Court upon final hearing, defendants' motion can avail them nothing. The authorities cited in defendants' brief only present the question of whether the depositions of A. J. Abbott and James Craig in the *form* taken in a former case are admissible here. Supposing their present motion were denied, it would still be impossible for defendants to introduce testimony in any other form in this case on the points on which A. J. Abbott and James Craig testified in the offered depositions.

This according to their own showing that the former is dead and that there is no living witness to testify to the particular facts which were within his knowledge of this case in his lifetime and that the latter "is the only living witness who can testify" to certain facts in this case but that he is old and infirm and if he did now testify the testi-

mony would "be exactly like that offered here." See above statements of fact Nos. 7, 8, 9; also No. 9 wherein complainant admits that were James Craig to now testify in this action on the questions propounded in his offered deposition they would be substantially like that offered here.

On the other hand should their motion be granted and the tendered depositions held admissible, at least as to their *form*, the defendants would gain nothing more than they have already accomplished by offering the same before the Stenographic Commissioner who shows or will show the same in his transcript with the objections thereto for the consideration of this Honorable Court at the final hearing of this case.

That is to say complainants' objections to the offers (Statement of Facts 2 and 4), will still remain to be determined at the final hearing on the matters of substantive law there raised no matter how this motion is decided because in practice substantive law matters would not be decided before the final hearing and defendants state "The ruling desired here is, of course, not of substantive law." (Brief, page 14.)

II.

The rule which the defendants are here seeking is not "purely procedural."

1. Here, as often, the "form and procedure" are so intermingled with the "substantive" it requires caution to keep them separate. Defendants have inadvertently intermingled the "substantive" with the "procedural." See Statement of Facts No. 8.

In this quotation from paragraph VIII of their brief defendants advance an argument to sustain their motion which deals mainly not with the "procedural" but with the "substantive" law in this case. However, to be consistent with their theory that they now seek only a procedural

ruling and with their contention "that no right of the complainant can be injuriously affected by the admission of this testimony" in the form of a deposition of record in a prior case (Brief, page 14). they cite no authorities to support their "substantive" argument.

Construing defendants' motion and brief strictly the rule they desire here must be determined to be "purely procedural," even though based in part on "substantive" argument, but the "substantive" question of law must be determined at the final hearing.

2. Granting that defendants urged this "substantive" argument merely to show why they considered it important that proper procedure be followed to obtain the personal testimony in this case of James Craig in the event that this Honorable Court should rule that his testimony on the same points in the *form* of a deposition in a prior case was inadmissible because of such *form*, nevertheless it is not now necessary to sustain defendants' motion as to this matter of procedure because complainant admits, as stated above, that were the said James Craig to now testify personally concerning the matters in his offered deposition that his testimony would be substantially the same as in his deposition already offered herein.

CONCLUSION.

We submit that neither the filing of said motion and brief, nor the granting of said motion is necessary to protect any substantial right of the defendants or "to avoid useless expenditure of time, labor, and money" by either or both the complainant and the defendants. We have shown that had these offers been made before a master who had sustained complainant's respective objections thereto and the master held the offered depositions inadmissible, defendants would not even then be permitted

to prevail in a like motion direct to the court before the final hearing of the case especially when as a matter of procedure they would be unable to replace the testimony by that of other witnesses in a different form. Defendants already have all the testimony in the record of the Stenographic Commissioner that they could introduce even if they should prevail in their motion here for a "purely procedural" rule.

Complainant's objections, to the offered depositions, of which defendants complain go to their admissibility as a matter of substantive law which will be briefed at length by both parties upon the final submission of this case.

We further submit that the defendants' motion and brief should not be filed, or if such is permitted to be done, that their motion be denied and the question of the admissibility of the offered evidence here in question be reserved until the final hearing of this case.

Respectfully submitted,

CLARENCE L. IRELAND,
Attorney General of Colorado,

SIDNEY P. GODSMAN,
Assistant Attorney General of Colorado.

FRED A. SABIN,
A. WATSON MCHENDRIE,
HENRY C. VIDAL,
Of Counsel.

FILE COPY

Office Supreme Court, U. S.
FILED
MAY 27 1928
CHARLES ELMORE CROPLEY
CLERK

In the Supreme Court of the United States.

OCTOBER TERM, 1927

No. [redacted], ORIGINAL [redacted] 976

THE STATE OF COLORADO, COMPLAINANT

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,

DEFENDANTS.

Motion for Leave to Plead to Answer of the State of Kansas.

ROBERT E. WINBOURN,
Attorney General of Colorado.

JAMES GRAFTON ROGERS,
HENRY A. DUBBS,
FRED A. SABIN,
A. WATSON MCHENDRIE,
HENRY C. VIDAL,
Of Counsel.

THE SMITH-BROOKS PRESS, DENVER

In the Supreme Court of the United States.

OCTOBER TERM, 1927

NO. 15, ORIGINAL

THE STATE OF COLORADO, COMPLAINANT

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

Motion for Leave to Plead to Answer of the State of Kansas

Now comes the complainant, The State of Colorado, and respectfully sets forth:

I

The defendant, The Finney County Water Users' Association, pursuant to leave of Court, has filed herein its "Separate Answer of the Defendant, The Finney County Water Users' Association," and has set up therein in Paragraph Twenty-second, beginning with Page Twenty thereof, certain matters in support

of a prayer for affirmative relief and has prayed affirmative relief. The complainant is advised, however, that the said The Finney County Water Users' Association intends forthwith to dismiss and withdraw that part of its said Separate Answer concerned with affirmative relief and also the prayer for affirmative relief. If, pursuant to the said understanding, both of the same are dismissed and withdrawn, no reply or pleading thereto is required from this complainant, as this complainant properly understands the procedure provided by the Court in this action, and in view of the said intention of The Finney County Water Users' Association to withdraw the same, the complainant does not, at this time ask leave to plead, but desires to communicate to the Court its reasons at this time for not asking leave to plead thereto.

II

The State of Kansas has also filed herein, by leave of Court, its "Separate Answer of the State of Kansas." The said Answer, in Paragraph Twenty-second, beginning on Page Thirty, and continuing to the end of the said Answer, has set forth certain matters as a basis of obtaining affirmative relief and has prayed for affirmative relief. Your complainant, The State of Colorado, being advised by counsel that it is necessary and proper that the said part of the Answer, being in the nature of a cross bill or counterclaim herein, requires, under the principles of equity pleading applicable to this cause, an answer or reply, desires to file herein, within a reasonable time to be fixed by the Court, a proper pleading addressed to the said part of the Answer.

WHEREFORE, The State of Colorado, complainant herein, respectfully asks leave to file herein, with-

in ninety days or such proper time as may be fixed by the Court, a reply to that part of the "Separate Answer of the State of Kansas" recited for the purpose of obtaining affirmative relief, and also asks leave to file herein, within the same period, a motion to dismiss that part of the "Separate Answer of the Defendant, The Finney County Water Users' Association" which prays affirmative relief, unless the latter be dismissed and withdrawn by the said The Finney County Water Users' Association within thirty days after the filing of this motion.

Respectfully submitted,

THE STATE OF COLORADO,

By Robert E. Winbourn,
Attorney General of Colorado.

James Grafton Rogers,
Henry A. Dubbs,
Fred A. Sabin,
A. Watson McHendrie,
Henry C. Vidal,
Of Counsel.

Office Supreme Court, U. S.
FILED
MAY 18 1929
CHARLES ELMORE CROPLEY
CLERK

FILE COPY

IN THE

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1928.

[redacted] ORIGINAL. 97

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

MOTION TO APPROVE STIPULATION FOR APPOINTMENT OF STENOGRAPHIC COMMISSIONER.

Come now the complainant and the defendants and respectfully pray:

That this Court approve the stipulation hereunto attached and made a part of this motion and appoint Millen S. Atwood, of Trinidad, Colorado, stenographic

commissioner pursuant to said stipulation, he having been agreed upon by the complainant and defendants.

ROBERT E. WINDBOURN,
Attorney General of the State of Colorado.
HENRY C. VIDAL,
JAMES GRAFTON ROGERS,
FRED A. SABIN,
A. W. McHENDRIE,
Solicitors for Complainant.
WILLIAM A. SMITH,
Attorney General of the State of Kansas;
JOHN G. EGAN,
Assistant Attorney General of the State of Kansas;
CHESTER I. LONG,
Solicitors for Defendant, the State of Kansas.
F. DUMONT,
LAWRENCE LEWIS,
CHESTER I. LONG,
Solicitors for Defendant, The Finney County Water Users' Association.

IN THE SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1928.

No. 14, Original.

THE STATE OF COLORADO, *Complainant,*

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, *a Corporation, Defendants.*

Stipulation.

It is hereby stipulated and agreed by the above entitled parties, subject to the order and approval of this

Court, that the evidence herein shall be taken by a stenographic commissioner, or commissioners, to be agreed upon by the parties hereto.

The commission of such commissioner, or commissioners, to be issued by the Clerk of this Court in the usual form upon the agreed designation of the parties hereto. The said commissioner, or commissioners, shall file with this Court a true and correct transcript of all the evidence taken by him, or them, and the original of all exhibits, duly certified, that shall be offered in said case.

The costs of taking such evidence, the transcript thereof, and the expenses of such commissioner to be paid originally by the complainant and defendant, The State of Kansas, one-half each, subject to the further order of this Court in the final taxation of the costs herein.

Dated at Denver, Colorado, May 14, 1929.

Robert E. Winbourn, Attorney General of the State of Colorado; Henry C. Vidal, James Grafton Rogers, Fred A. Sabin, A. W. McHendrie, Solicitors for Complainant; William A. Smith, Attorney General of the State of Kansas; John G. Egan, Assistant Attorney General of the State of Kansas; Chester I. Long, Solicitors for Defendant, the State of Kansas; F. Dumont Smith, Lawrence Lewis, Chester I. Long, Solicitors for Defendant, the Finney County Water Users' Association.

No. 5 orig.

In the Supreme Court

of the United States

October Term, 1941

THE STATE OF COLORADO, *Complainant,*

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

ORIGINAL

Application of Defendants for an Order Directing the Procedure for Submission of the Cause to the Court.

JAY S. PARKER,
Attorney General of the State of Kansas,
Topeka, Kan.

ELDON WALLINGFORD,
Assistant Attorney General,

W. E. STANLEY,
First National Bank Building,
Wichita, Kan.

Solicitors for the State of Kansas.

W. E. STANLEY,
Solicitor for The Finney County Water Users' Association, a Corp.

19-3214

In the Supreme Court

of the United States

October Term, 1941

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

No. 5

ORIGINAL

Application of Defendants for an Order Directing the Procedure for Submission of the Cause to the Court.

Come now the State of Kansas and The Finney County Water Users' Association, a corporation, defendants above named, and show to the court:

I

That this cause was instituted at the October, 1927, term of this court and involves a controversy between the State of Colorado and the State of Kansas to determine the rights of the parties in and to the waters of the Arkansas river and with respect to other matters as more fully appears by the bill and answer.

II

That on the 28th day of May, 1929, this court appointed M. S. Atwood, Esquire, as stenographic commissioner to take the testimony in the cause and transcribe the same; it then being the practice that following the taking of testimony, the cause would be heard by the court upon the bill, answer and printed record.

That thereafter the taking of testimony proceeded before the stenographic commissioner, M. S. Atwood, at various times and places, full opportunity having been afforded all parties for the introduction of all testimony desired.

That on the 21st day of December, 1939, both parties having rested, the taking of testimony was closed and completed. That the said completed testimony consists of 36 volumes, or a total of 6,361 typewritten legal cap pages and 316 exhibits.

III

That immediately subsequent to the completion of the testimony, counsel for the defendants herein suggested immediate steps to prepare the record for presentation to this court and were met with the suggestion from counsel for complainant that "since all the pertinent facts material to this controversy had been exhaustively

developed and are now in the record that an earnest effort be made to arrive at the terms of a consent decree which might be entered in this court."

To these suggestions to negotiate for such a compromise, counsel for defendants agreed and since the 1st of January, 1940, parties hereto have been engaged in efforts to effect a compromise and settlement of said litigation. These efforts have but recently failed and only proved to have unnecessarily delayed the final determination of this cause and it now becomes necessary that the cause be submitted by the parties to this court for its determination as promptly as possible.

IV

The parties hereto have been informed by the clerk of this honorable court that whereas at the time the bill of complaint was filed in this case, it was the practice of the court to appoint a commissioner to take testimony and following that to hear the case on the bill, answer and printed record; that more recently it has been the practice for the court to appoint a special master to take testimony and file a report, together with findings of fact and conclusions of law. Opportunity then being afforded counsel to except to the findings and orally argue upon those exceptions.

V

The defendants herein desiring to present this matter to this court for its determination as soon as practicable and in view of the fact that the taking of testimony has been completed before the stenographic commissioner and both parties having rested and the taking of testimony closed, the defendants, under such existing circumstances as are herein set out, respectfully request directions as to the methods which this court desires the parties to follow in submitting this controversy to the court for its determination, namely, whether the same should be continued as originally contemplated and submitted on the bill, answer and printed record, or whether a special master should be appointed to whom the testimony already taken and completed would be presented and who could then file with the court upon the basis of such testimony a report, together with findings of fact and conclusions of law.

VI

Defendants respectfully request that

(a) In the event this honorable court prefers to have the testimony heretofore completed submitted to it upon the bill, answer and printed record that an order be entered fixing a time for the submission of abstracts and briefs, or

(b) If the court prefers that the testimony heretofore completed be submitted to this court upon the report of a special master, together with findings of fact and conclusions made by such special master, the defendants request that an order be entered appointing a special master to consider the completed testimony and record taken before Commissioner Atwood appointed by this court in such form and manner as the court may direct.

All of which is respectfully submitted.

JAY S. PARKER,
Attorney General of the State of Kansas,
Topeka, Kan.,

ELDON WALLINGFORD,
Assistant Attorney General,

W. E. STANLEY,
First National Bank Building,
Wichita, Kan.,

Solicitors for the State of Kansas.

W. E. STANLEY,
Solicitor for The Finney County Water Users' Association, a Corp.

19-3214

IN THE

Supreme Court of the United States

October Term, 1941.

No. 5
Original.

THE STATE OF COLORADO,
Complainant,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a corporation,
Defendants.

MOTION OF COMPLAINANT, STATE OF COLORADO.

GAIL L. IRELAND,
Attorney General of the State of Colorado,
State Capitol,
Denver, Colorado,

A. W. MCHENDRIE,
Pueblo, Colorado,

HENRY C. VIDAL,
Equitable Bldg.,
Denver, Colorado;

ARTHUR C. GORDON,
Lamar, Colorado,

JEAN S. BREITENSTEIN,
Symes Bldg.,
Denver, Colorado,
Attorneys for Complainant.

CLARK QUICK-PRINTING CO., LAWRENCE 1332-34, DENVER, COLO.

IN THE

Supreme Court of the United States

October Term, 1941.

No. 5
Original.

THE STATE OF COLORADO,

Complainant,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a corporation,

Defendants.

MOTION OF COMPLAINANT, STATE OF COLORADO.

The State of Colorado, Complainant above named, appearing by Gail L. Ireland, its Attorney General, upon the direction of the Hon. Ralph L. Carr, Governor of the State of Colorado, respectfully presents this motion for the appointment of a Special Master and says:

1.

The complaint in this action was filed by leave of Court granted January 3, 1928 and thereafter in March 1928, the defendant, State of Kansas, filed its answer and joined issue with the complainant. Thereafter the Court appointed the Honorable M. S. Atwood as stenographic commissioner to take testimony in the cause and the taking of such testimony has proceeded and now consists of 36 volumes embracing 6,361 typewritten pages and 316 exhibits.

The last testimony offered was submitted on December 21, 1939, at which time the parties rested.

Since December 21, 1939, the parties hereto have been engaged in efforts to effect a settlement of their controversies, which efforts have not as yet been successful so that it becomes advisable that the cause be submitted to the Court for its determination.

2.

The cause involves a controversy over the claims of the parties to rights in and to the waters of the Arkansas River, an interstate stream, and the enjoining of Defendants from further prosecution of actions in the inferior courts, and other matters as more fully appears by the Bill and Answer.

3.

Complainant has been informed that whereas at the time said cause was begun it was the practice of the Court to hear the same upon the Bill, Answer, and printed record of the testimony taken before the stenographic commissioner, it is now the prevailing practice for the Court to appoint a special master to whom the cause is referred to consider the testimony and make his report with his findings of facts, conclusions of law and a recommended

decree, opportunity being given for counsel to except to the findings and conclusions and to present briefs and oral arguments upon such exceptions.

4.

The evidence as now presented consists largely of expert testimony on engineering and scientific subjects. By reason of its nature such evidence is difficult to abstract or condense and at the same time retain the full benefit of the engineering and scientific investigations.

By reason of the nature of the case, the length of the record as now existing and the nature of the evidence presented, it would seem necessary to have this Honorable Court refer the matter to a Special Master with full powers to review the evidence heretofore presented, to hear and consider such further evidence as may be presented by either of the parties, or which he himself may desire, and to present findings of facts, conclusions of law and a proposed decree for such revision, amendment, adoption or consideration as the Court may see fit to make.

5.

Complainant further respectfully requests that the parties hereto be given permission to agree upon such person or persons experienced and qualified in Irrigation Law, whose name or names may be submitted to the Court for consideration for approval and appointment as Special Master.

6.

In support of this motion the State of Colorado presents herewith the Affidavit of its Attorney General, Gail L. Ireland.

Wherefore the State of Colorado, complainant above named, moves the Court that it appoint a Special Master in this cause with the powers heretofore suggested in this motion or such other powers as to the Court may seem proper.

GAIL L. IRELAND,
Attorney General of the State of Colorado,
State Capitol,
Denver, Colorado,

A. W. MCHENDRIE,
Pueblo, Colorado,

HENRY C. VIDAL,
Equitable Bldg.,
Denver, Colorado,

ARTHUR C. GORDON,
Lamar, Colorado,

JEAN S. BREITENSTEIN,
Symes Bldg.,
Denver, Colorado,
Attorneys for Complainant.

AFFIDAVIT.

STATE OF COLORADO }
City and County of Denver } ss.

Gail L. Ireland, being first duly sworn, upon oath deposes and says that he is the duly elected, qualified and acting Attorney General of the State of Colorado, and as such in his official capacity and by the direction of the Honorable Ralph L. Carr, Governor of the State of Colorado represents and appears for the State of Colorado in this cause, and that he makes this affidavit in support of the motion for the appointment of a Special Master presented herewith.

1. Since issues have been joined in this cause, the evidence as presented to and transcribed by the Hon. M. S. Atwood, Stenographic Commissioner appointed by this Court, consists of 36 volumes, containing 6,361 typewritten pages and 316 exhibits,—such evidence being largely of an engineering and scientific nature relating to agricultural, climatological, and hydrological data, and to the respective needs of the two states for water of the Arkansas River for agricultural, domestic, and other purposes.

2. The said evidence heretofore presented to the Stenographic Commissioner relates to conditions in the basin of the Arkansas River as existing up to or about the year 1932. Since 1932 there have been for several years in the basin of the Arkansas River severe and prolonged drouths. No evidence has been introduced in this case as to the effects of such drouth conditions upon the supplies of or the demands for the water of the Arkansas River, but such evidence is necessary to a proper determination of the issues in the case.

3. On or about the year 1933 an opportunity presented itself to secure the construction by the United States of a combined flood control and conservation reservoir on the

Arkansas River in Colorado, about 58 miles upstream from the Kansas-Colorado boundary line, then known and described as The Caddoa Reservoir. On or about the year 1940 contracts were awarded for the construction of said reservoir (now known as the John Martin Reservoir Project) and work has proceeded thereon until the project as a whole is about 40% completed and the dam and appurtenant works are about 26% completed. No evidence has been presented in this case as to the effect which the storage of water in said reservoir will have upon the regimen of stream flow and the supplies thereof available for use, but such evidence is necessary to a proper determination of the issues in the case.

Dated at Denver, Colorado, this 27th day of March, A. D. 1942.

GAIL L. IRELAND

Subscribed and sworn to before me this 27th day of March, A. D. 1942.

Witness my hand and official seal.

My commission expires July 6, 1942.

ANN G. LANDY,
Notary Public.

The original of this affidavit has been filed with the Clerk of the Supreme Court of the United States.

FILE COPY

MAY 24 1943
CHARLES ELMORE CROPLEY
CLERK

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1942

No. 5 Original

THE STATE OF COLORADO,
Complainant,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,
Defendants.

REPORT AND RECOMMENDATIONS OF THE SPECIAL MASTER.

INDEX.

	Page
Certificate of Special Master	23
Certificates of Stenographic Reporter	636, 7074 R.
Conclusions of law of the Special Master	14
Established principle applicable to the rights of the parties	1
Exhibits of Complainant	(1 to 233, inc.)
Exhibits of Defendants	(1 to 135, inc.)
Findings of fact of Special Master	3
Final submission of the case	2
Hearing on motion to take and consider additional evidence	6366 R.
Order and opinion of Special Master on Motion to take additional testimony	6452 R.
Order of reference to Special Master	6364 R.
Procedure in taking testimony before the Special Master and submission of the case	2
Recommendations of Special Master of a decree	19
Testimony taken before the Stenographic Commissioner appears in volumes 1 to 36, Inc.	7 to 6361 R.
Testimony taken before Special Master appears in volumes 37 to 39, Inc.	6469 to 7173 R.
The names of witnesses and record of their evidence for both the Complainant and Defendant appears in the indexes of Reporter in each volume of the testimony.	

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1942

No. 5 Original

THE STATE OF COLORADO,
Complainant,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,
Defendants.

REPORT AND RECOMMENDATIONS OF THE SPECIAL MASTER.

To the Honorable Supreme Court of the United States:

I have the honor to submit herewith my report of findings of fact, conclusions of law, and recommendations for a decree in the adjustment of the use of the waters of the Arkansas River under the order of the Court of May 4, 1942, together with the testimony and exhibits taken.

Respectfully submitted,

CHARLES C. CAVANAH,
Special Master.

May 1, 1943.

Established Principle Applicable In a Suit Between States Involving Interstate Waters. The principle applicable in a suit between States involving interstate waters

is that each state is entitled to its equitable share of the benefits derived from such waters, and that an equitable apportionment of the water supply and flow of the Arkansas River and its tributaries as between the State of Colorado and the State of Kansas should be made. *Kansas* v. *Colorado*, 206 U. S. 46, 27 Sup. Ct. 655. *Missouri* v. *Illinois and The Sanitary District of Chicago*, 200 U. S. 496. *Georgia* v. *Tennessee Copper Co.*, 206 U. S. 230-237. *Wyoming* v. *Colorado*, 259 U. S. 419, 49 Sup. Ct. 552. *Connecticut* v. *Massachusetts*, 282 U. S. 660, 51 Sup. Ct. 286. *State of New Jersey* v. *State of New York*, 283 U. S. 336, 51 Sup. Ct. 478. *Hinderlider* v. *La Platta River and Cherry Creek Ditch Company*, 304 U. S. 92, 58 Sup. Ct. 803.

Procedure in Taking the Testimony and Final Submission of the Case. The taking of testimony was commenced on November 5, 1929, and continued at different places and times before the stenographic Commissioner appointed by the Court, until December 21, 1939, as appears in volumes one to thirty-six inclusive, and thereafter continued before the Special Master as appears in volumes 37 to 39 inclusive of the transcript of the evidence, which sessions were held at Denver, Colorado, on October 19, 1942 and at Topeka, Kansas, on December 14, 1942, after order of the Special Master of July 11, 1942, allowing the taking of additional testimony, and both parties having rested, the case was finally submitted after filing of briefs and oral arguments at Boise, Idaho, on March 22, 1943.

The evidence is voluminous and conflicting on many of the material issues of fact and presents a history of the Arkansas River, the territory through which it runs, its origin, tributaries, source of water supply, length, course and consumption of water therefrom.

Findings of Fact.

The cause having been originally filed in the Supreme Court of the United States and referred to the Special Master under order of May 4, 1942, directing him to consider the testimony which had been taken by the stenographic Commissioner, and to take such additional testimony as may be deemed necessary and to make findings of fact and conclusions of law and recommendations for a decree, and after a consideration of the evidence, briefs and arguments of counsel, the Special Master finds and concludes the facts to be as follows:

First

The State of Colorado was admitted in to the Union on August 1, 1876 and the State of Kansas was admitted on January 29, 1861, and the defendant, The Finney County Water Users' Association is a corporation organized, chartered and doing business in the State of Kansas. The character of the soil, climate and precipitation in the Arkansas River basin appears to be, that in Colorado and Kansas the soils in both areas are well suited to irrigation and in general western Kansas soils run much lower in gravel and sand, and higher in silt content than those in the eastern Colorado area, and the more porous soils such as exist in Colorado, plants find it easier to absorb moisture from the soils than they do in the more compact soils in western Kansas and evaporation there is less and soils such as exist in western Kansas area will retain larger quantities of water without loss by deep percolation. The mean average annual temperatures in the Kansas area range from two to five degrees higher than in the Colorado area, and the rainfall there is greater than in Colorado.

SECOND

Course of the Arkansas River. It is one of the principal tributaries of the Mississippi River and it and its tributaries are non-navigable streams arising among the higher ranges of the Rocky Mountains and is formed by the junction of the branches known as East Fork and Tannesses Fork with Lake Fork, at a point near Leadville near the center of the State of Colorado, where the elevation approximates 10,000 feet above sea level. These headwater branches extend up to elevations of 10,500 to 12,000 feet at mountain passes across the Continental Divide, and up to 14,000 feet at the crests of the highest mountain peaks and it takes thence a southerly and southeasterly direction passing through the Royal Gorge Canyon to Canon City where the elevation is about 4,900 feet and about 100 miles below its source it passes through Canon City and Fremont County in Colorado. The area above Canon City is drained by small tributaries contributing to the stream the mountain runoff, where precipitation runs from 20 to 30 inches annually. Its source in the vicinity of Leadville is in the higher range of the Rocky Mountains with a rapid descent until it enters the more pronounced canyon sections immediately below Salida and from there to Canon City it flows through a pronounced canyon section. After it leaves the Royal Gorge Canyon immediately above Canon City it enters through a more or less rugged country, being generally hemmed in by narrow valleys and foothills, and the character of the country is characteristic until it approaches the City of Pueblo, where the valley widens out and the adjacent foothills recede, and from Canon City to Pueblo it lies at an elevation of approximately 4,300 feet and the fall of the river is about 15 feet to the mile. It thence flows from Pueblo east to the Colorado-Kansas state line, passing through country where the topography is more gentle

and tributaries entering from both sides, and the fall of the river from Pueblo to La Junta averages 9 feet per mile, and from La Junta to the state line about 7 feet per mile, and from there to Dodge City the fall of the stream is about 6.8 feet per mile, and from Dodge City to the Oklahoma state line the average fall is about 5.5 feet per mile. The area of the basin in Colorado as drained by the river amounts to 25,258 square miles and the area in Kansas is approximately 18,238 square miles. Its length in the State of Colorado is about 320 miles and in the State of Kansas about 390 miles, and after entering the State of Kansas it flows through southwestern and south central part of that state, leaving the state at its southerly boundary to enter the State of Oklahoma and flows then for several hundred miles before reaching the Mississippi River. The main course of the stream of the river in the state of Colorado traverses an arid country consisting of mountain valleys and flows across plains in a valley of shifting sand which at times and places makes it difficult to distinguish from the flat contours of the open prairie and along which course agricultural crops are grown by means of irrigation. In its course through the State of Colorado there are numerous small mountain tributaries and on the plains are some large floodwater tributaries deriving water from the slopes of the Rocky Mountains. The character of the flow of the river in Colorado is variable from year to year and season to season and day to day, and the main river at any one point may be almost without water one day and have a flood in it the next day and the following day have practically its original condition. The course of the river after it leaves the Colorado-Kansas state line and flows through Kansas is an easterly course through the town of Syracuse and Garden City at which point it takes a more southeasterly course to a point near the town of Ford, in Kansas; from thence it flows northeasterly to Great Bend, in Kan-

sas, thence southeasterly through Hutchinson and to Wichita, and thence southerly to where it crosses the State line south of Arkansas City.

The entire length of the Arkansas River from its source to its mouth is about 1500 miles. The total area of the State of Colorado in square miles is about 104,000 and in the State of Kansas about 82,000 square miles.

The slope of the country is higher in Colorado than in Kansas, and the grade of the river decreases from its headwaters down stream.

The geology in the two states is similar in respect to the character of the formations other than here stated, but the area or extent of such formation in the two states is different.

The general characteristics of the river and the valley and the country adjoining are practically uniform from the point where the river emerges from the Rocky Mountains to a point about 200 miles east of the western border of Kansas. The lands in Kansas attempting to practice irrigation are dependent upon the flow of the Arkansas River which comes into Kansas from Colorado.

THIRD.

Water Supply Of The Arkansas River And Its Tributaries. The character of the flow of the river in Colorado is widely variable from year to year and season to season, and its general flow divides itself into three groups or kinds of flow, namely; First, the perennial flow from the high mountains consisting of melting snows in the mountains, varying almost from day to day. Second, the intermittent flow, resulting from intense rainstorms on plains area, and, Third, a more or less constant flow varying slightly from year to year and from month to month due to return seepage from irrigated lands. The tributaries to the river

contribute water in measurable quantities which is due to rainfall, surface runoff and seepage return water from irrigation and in some instances from melting snows in the mountains, and which increases gradually from Pueblo, Colorado, to Dodge City, Kansas. The rainfall zones in Colorado are irregular as the result of the mountainous area, and it gradually increases as one goes east from the Rocky Mountain Range. The return flows to the river have been developed in amounts which have had, to some extent, the effect of increasing the flow of the river, the exact amount of which is uncertain at different times and does not appear definite.

There are periodical flood flows of unusable waters of summer seasons flowing in the river and continuing at times for several hours to several days which consist of sudden melting of snows in the mountain area and rainfall in the plains area and can and are to some extent captured and conserved by small reservoirs and the incompleted Coddoa dam and reservoir.

Precipitation, melting snows, temperature, evaporation and wind velocity, and the character of the soil appear to be factors which are inter-related in crop production and of sources of water supply of the Arkansas River, and in the mountainous region along the western boundary of the Arkansas River Basin the annual precipitation runs between 20 and 30 inches, which is principally in the form of snow, and going eastward to the plains region in Colorado, the precipitation in this area ranges generally between 11 and 16 inches, and passing further east to the area from the Colorado-Kansas state line to Dodge City, the precipitation ranges from 15 to 20 inches, and continuing east along the river and from where the first tributary in Kansas joins the main stream and then to the Oklahoma state line the precipitation increases 20 to 30 inches. The mean average annual

temperature in the Colorado area ranges from two to five degrees lower than in Kansas area and in Western Kansas the wind velocities are higher than in the eastern region in Colorado, which has an effect upon evaporation. The soils in both Colorado and Kansas areas are well suited to irrigation, but the character of the soil in Kansas area, which contains more silt than in the Colorado area, will hold larger quantities of water without loss by deep percolation.

FOURTH.

Both States Recognize The Need Of Water For Irrigation.

Both states from their beginning have recognized the need of water for irrigation and the using for that purpose of the public waters in their states. There were ditches and reservoir development in both states for the use of the waters of the Arkansas River and its tributaries, and as years went by both states increased their use by placing under cultivation more acreage, and it appears that Colorado increased such use more than did Kansas, and as the quantity of the water supply of the Arkansas River Basin was, and is limited, the activity in both states in developing their irrigated areas brought about the present and past controversies, over the use of water for irrigation. Their difficulties have been of a continuous nature from 1901 to the present. In 1901 the State of Kansas instituted a suit in the Supreme Court of the United States against the State of Colorado to enjoin the diversion by Colorado of the water of the Arkansas River. The Court disapproved the contentions of both parties and the case was dismissed without prejudice to the right of Kansas to institute new proceedings whenever it shall appear by saying that "if the depletion of the waters of the river by Colorado continues

to increase there will come a time when Kansas may justly say that there is no longer an equitable division of benefits, and may rightfully call for relief" and "we must consider the effect of what has been done upon the conditions in the respective states and so adjust the dispute upon the basis of equality of rights as to secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of the like beneficial effect of a flowing stream". Since that decision there were suits instituted in the United States District Court of the District of Colorado by the United States Irrigation Company in its private capacity, the predecessor in interest of the defendant The Finney County Water Users Association, which was dismissed, and thereafter the defendant, The Finney County Water Users Association filed two suits in the United States District Court in the District of Colorado against Colorado ditches and reservoirs seeking to secure recognition of priority of right of the flow of the river. These two suits are now pending and are the cases against which an injunction in the present suit is sought to prevent further prosecution.

FIVE.

Depletion By Colorado Of The Water Supply Of The Arkansas River Since The Taking Of Testimony In The Case Of Kansas Against Colorado Decided In 1907. There has been since the taking of testimony in the case of Kansas against Colorado cited in 206 U. S. 46, in 1907, a material increase in the river depletion by Colorado of the water supply of the Arkansas River, which has been consumed and used by Colorado users for irrigation purposes and which has diminished the flow of the water into the State of Kansas and that, by reason thereof there has been injuries to the substantial interests in Kansas.

SIX.

The Economical Use Of The Water Supply Of The Arkansas River And Its Tributraies By Colorado And Kansas. Both states have appropriated all of the natural flow of the Arkansas River and its tributaries. The average annual natural flow of the river and its tributaries is 1,240,000 acre feet of which the average annual dependable and fairly continuous water supply and flow of the Arkansas River and its tributaries is 1,110,000 acre feet, and after considering the character of the soil, precipitation, temperature, evaporation, proper requirements of transportation of the water and an economical use of water, the quantity of water awarded annually to the respective state is sufficient and feasible in the practicable and economical use of water for irrigation and crop production in the arid areas of the two states.

SEVEN.

The irrigated acreage in the state of Colorado, of the water supply of the Arkansas River and its tributaries is 469,168 acres which has increased from the time the users of that state first began to irrigate their lands to the present, and such water supply so used is of the waters of the river and its tributaries in Colorado, and has after considering it and the return flow section resulted in the diminution of the yearly average flow at the state line.

EIGHT.

Amount Of Water Awarded To The State Of Colorado. Of the average annual dependable water supply and flow of the Arkansas River and its tributaries there should be awarded and delivered to Colorado 925,000 acre feet, and in the event of a deficiency or increase in the flow of the river and its tributaries, the then available supply in the

river and its tributaries should be prorated in relation to the dependable average annual amount so awarded to Colorado.

NINE.

Amount Of Water Awarded To The State Of Kansas. The irrigated acreage in the State of Kansas of the water supply of the Arkansas River and its tributaries is 65,028 acres, and as the Colorado water users having the first opportunity to utilize and consume the stream flow of the river before it passes into the state of Kansas, there should be awarded and delivered to the State of Kansas, at the Colorado-Kansas state line, 185,000 acre feet annually of the average annual dependable water supply and flow of the river stream for the irrigation in Kansas of the lands now being irrigated, and for lands to be irrigated, and lands irrigated from the waters of the Arkansas River prior to the time the State of Colorado increased her development in irrigation, and of which amount 150,000 acre feet of water should be delivered to the State of Kansas at the Colorado-Kansas state line during the season from April 1 to October 1, of each year, and 35,000 acre feet thereof to be delivered at the state line during the winter season from October 1 to April 1, at such times and in such amounts of the 35,000 acre feet as the same could be delivered for irrigation or storage when required by the water officials of Kansas, and in the event of a deficiency or increase in the flow of the river and its tributaries, the then available supply in the river should be pro-rated in relation to the dependable average annual amount so awarded to Kansas.

TEN.

Flood Waters Of The Arkansas River, and its tributaries are periodical and consists of melting mountain snows and intense rainfalls in the plains area, and when so flooding

the waters extend over lands for some distance from the natural stream of the river and can only be controlled by the construction of flood control dams and reservoirs in the Arkansas River.

ELEVEN.

Industrial Users. There are appropriations of water from the river in the states and used for industrial purposes and are of little if any, effect on the stream flow and water supply and the amount of water used for irrigation.

TWELVE.

Measuring Stations To Be Established. The water supply of the basin comes from two distinct sources, the mountain water supply and the plains water supply, the first is irregular in its occurrence as the rise of the streams occurring with melting snows and the other, or plains runoff being erratic, sometimes large and sometimes small. Two designated measuring points should be established, one of which will serve as an index of mountain water supply and another station selected which will serve as an index of the plains water supply. The water measured at those stations will vary up or down as those two types of the water supply in the basin varies, and the burden of benefits of wet years and dry years would be borne in the same proportion as the equitable distribution of water supply is decreed. In allowing the water supply one station should be located at Canon City, Colorado, which would serve as an index of the mountain water, and the other station, a measuring station to be located near the mouth of the Purgatoire River where the runoff at that point is practically all plains runoff and it would serve as an index of the plains water supply, and the two stations when used together would determine the amount of river flow to come down the river for delivery to Colorado and

to Kansas, and the amount of water awarded to the state of Kansas, at the state line where a station should be located and a measuring device established to determine the amount of water for delivery to the state of Kansas to be measured day by day as such water supply originates and becomes measurable as stream flow.

THIRTEEN.

Caddoa Reservoir. It is a channel dam and reservoir being constructed by the Government at Government expense and to be owned and controlled by it for the purpose of regulating the control of flood and surplus water flowing in the Arkansas River at a point approximately 50 miles in Colorado, from the Colorado-Kansas line. The project plans contemplate a reservoir when completed, of a total capacity of 655,000 acre feet, and has at present completed capacity of 270,000 acre feet. On account of present conditions the Government ceased in the final completion of it. Thereafter on December 18, 1933, the states of Colorado and Kansas undertook by written stipulation, signed by their Governors, Attorney Generals, counsel and engineers, to apportion the water supply in the Arkansas River after it was impounded in the reservoir as between the two states, with the provision that the construction and operation of the dam and reservoir shall not disturb the status quo of the diversion of he water for beneficial uses from the river by the ditches and canals then constructed and operated in both states and the stipulation was without prejudice to the claims of either party in the present case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties to water flowing in the Arkansas River or stored in the reservoir. The stipulation was not approved by the Legislature of either state or by Congress, and was not

to become effective until the dam and reservoir was completed. The reservoir has a limited life and is a temporary achievement.

FOURTEEN.

That there was instituted and still pending in the United States District Court for the District of Colorado the two suits in equity brought by the defendant. The Finney County Water Users' Association against individual Colorado Water Users of the waters of the Arkansas River, entitled The Finney County Water Users' Association against the Graham Ditch Company and others and the second suit, entitled The Finney County Water Users' Association against the Coler Ditch and Reservoir Company of Colorado and others.

Conclusions of Law.

As Conclusions of Law from the foregoing facts, the Special Master Concludes and Decides:

ONE.

That the real issue involved in the present case is the equitable apportionment of the water supply of the Arkansas River and its tributaries in such manner as to secure as nearly as possible to each state of irrigation without depriving either the beneficial effects of a flowing stream, The Arkansas River, and to grant to each state relief and protection of their equitable portion of the water supply of the Arkansas River with certainty and definiteness of the quantity, continuity and character as is measured out to them at a definite place so that delivery can be compelled.

TWO.

That the State of Colorado be awarded and delivered to it 925,000 acre feet annually of the average annual dependable

water supply of the Arkansas River and of the stream flow of the river and its tributaries, and in the event of a deficiency or increase in the natural flow of the river, the then available supply in the river and its tributaries should be prorated in relation to the dependable average annual amount so awarded to Colorado.

THREE.

That there should be awarded and delivered to the State of Kansas at the Colorado-Kansas State line 185,000 acre feet annually of the average annual dependable water supply and flow of the river stream for the irrigation in Kansas of the lands now being irrigated, and for lands to be irrigated, and lands irrigated from the waters of the Arkansas River prior to the time the State of Colorado increased her development in irrigation, and of which amount 150,000 acre feet of water should be delivered to the State of Kansas at the Colorado Kansas State line during the season from April 1 to October 1, of each year, and 35,000 acre feet thereof to be delivered at the State line during the winter season from October 1 to April 1, at such times and in such amounts of the 35,000 acre feet as the same could be delivered for irrigation or storage when required by the water officials of Kansas, and in the event of a deficiency or increase in the flow of the river and its tributaries, the then available supply in the river should be prorated in relation to the dependable average annual amount so awarded to Kansas.

FOUR.

That the flood waters of the Arkansas River and its tributaries may be controlled and applied to beneficial use by either Colorado or Kansas in the respective amounts awarded to them, as such flood water flow in the river and its tributaries in the States.

FIVE.

There is required to be established by the States of Colorado and Kansas, three modern measuring devices at stations to accurately measure the water supply of the Arkansas River and the flow of the river and its tributaries, one of which is to be located at a station at Canon City, Colorado and one to be located near the mouth of the Purgatoire River and another station where the water shall accurately be measured, located on the river at the Colorado-Kansas State line to determine the amount of water flowing in the river that should be delivered to the State of Kansas, and the expense of the construction and operation of the measuring devices shall be equally borne by the States of Colorado and Kansas, and in the event the two States are unable to agree upon one to so construct and operate the same, then the Court should appoint some one to construct and operate such measuring devices.

SIX.

That under the issues and evidence in the present suit the States of Colorado and Kansas are not denied the right to assert their claim in the present suit of an equitable proportion of the waters flowing in the Arkansas River and its tributaries.

SEVEN.

That the incompleted dam and reservoir known as the Caddoa reservoir in the channel of the Arkansas River being constructed by the Government, and the stipulation executed by certain officials, attorneys and engineers of the States of Colorado and Kansas purporting to represent said States is not binding upon either of said States, nor to be embodied in a decree in the present suit permanently adjudicating an equitable apportionment of the water supply

of the Arkansas River and its tributaries between the two States.

EIGHT.

That a permanent injunction should be granted against the defendant, the Finney County Waters Users' Association and its officers, agents and representatives, enjoining them from further prosecution of the two suits brought by The Finney County Waters Users' Association, and now pending in The United States District Court of the District of Colorado entitled the Finney County Water Users' Association against The Graham Ditch Company and others, and The Finney County Water Users' Association against The Coler Ditch and Reservoir Company of Colorado, and others, as whatever rights it or others in either of the States of Colorado and Kansas may have to the use of said waters are indissolubly linked with those of the States in which they may be, in the equitable apportionment of the said waters.

NINE.

That the States of Colorado and Kansas and each of them and their officers, agents, representatives and employees are perpetually enjoined from diverting and using any water from the Arkansas River and its tributaries in excess of the amounts awarded and herein decreed to them.

Judgment may be entered in harmony with the foregoing findings of fact and conclusions of law, containing appropriate provisions for the enforcement thereof, costs of the cause shall be divided and shall be paid by each party paying its own costs.

Dated May 7, 1943.

CHARLES C. CAVANAH,
Special Master.

SUPREME COURT OF THE UNITED STATES

THE STATE OF COLORADO,
Complainant,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION,
Defendants.

DECREE.

The cause having been originally filed in the Supreme Court of the United States and referred to the Stenographic Commissioner to take the testimony and thereafter, under Order of the Court, on May 4, 1942, referred to the Special Master, directing him to consider and to take such additional testimony as may be deemed necessary and to make findings of fact and conclusions of law and recommendations for a decree, and the evidence adduced by the parties having been heard and all evidence in the case having been considered by the Special Master, and findings of fact and conclusions of law and recommendations for a decree having been made, and the Court after considering said findings and conclusions of law and recommendations for a decree by the Special Master and the evidence and the arguments of counsel for the parties,

It Is Ordered, Adjudged and Decreed as follows:

(One.)

That the State of Colorado is awarded, granted and decreed to be the owner and entitled to the use of, and to be delivered to it 925,000 acre feet of water annually of the annual

dependable water supply and flow of the stream of the Arkansas River and its tributaries, and in the event of a deficiency or increase in the natural flow of the Arkansas River and its tributaries, the then available supply of water in the river and its tributaries shall be pro-rated in relation to the dependable amount annually here awarded and granted to the state of Colorado.

(Two.)

It is also considered, ordered and decreed that the State of Kansas is awarded, granted and decreed to be the owner and entitled to the use of and to be delivered to it at the Colorado-Kansas state line, 185,000 acre feet of water annually of the annual dependable water supply and flow of the stream of the Arkansas River, and of which amount, 150,000 acre feet thereof shall be delivered to the state of Kansas at the Colorado-Kansas state line during the season from April 1 to October 1 of each year, and 35,000 acre feet thereof to be delivered to the state of Kansas at the Colorado-Kansas state line during the winter season from October 1 to April 1, at such times and in such amounts as and when required by water officials of the State of Kansas, and in the event of a deficiency or increase in the natural flow of the Arkansas River and its tributaries, the then available supply of water in the river and its tributaries shall be pro-rated in relation to the dependable amount annually here awarded and granted to the State of Kansas.

(Three.)

It is further considered, ordered and decreed, that the flood waters of the Arkansas River and its tributaries may be controlled and applied to beneficial use by either of the states of Colorado and Kansas in the respective amounts awarded to them as such flood waters flow in the river and its tributaries in the States.

(FOUR.)

It is further considered, ordered and decreed, that there is required to be established by the State of Colorado and the State of Kansas, three modern measuring devices at stations to measure accurately the water supply of the Arkansas River and the flow of the river and its tributaries, one of which is to be located at a station at Canon City Colorado, and one to be located near the mouth of the Purgatoire River, and one to be located, where the water flowing in the river shall accurately be measured on the Arkansas River at the Colorado-Kansas State line, of the amount of water here decreed to be delivered to the state of Kansas, and the expense of the construction and operation of the measuring devices shall be equally borne by the states of Colorado and Kansas, and in the event the two states are unable to agree upon one to so construct and operate the same, then the Court shall appoint some one to construct and operate such measuring devices.

(FIVE.)

It is further considered, ordered and decreed that the states of Colorado and Kansas are granted the right in the present suit to assert their respective rights and claims of an equitable apportionment of the waters in the Arkansas River and its tributaries.

(SIX.)

It is further considered, ordered and decreed that the construction of the incompleted dam and reservoir in the channel of the Arkansas River known as the Caddoa Reservoir, and the execution of the purported written stipulation of date December 18, 1933, by the officials, attorneys and engineers of the states of Colorado and Kansas are not

binding upon either of the two states in the adjudication of an equitable apportionment of the water supply of the Arkansas River and its tributaries between the two states.

(Seven.)

It is further considered, ordered and decreed that a permanent injunction is granted against the defendant The Finney County Water Users' Association and its officers, agents and representatives, enjoining the further prosecution of the two suits brought by it and now pending in the United States District Court in the State of Colorado, entitled, The Finney County Water Users' Association against The Graham Ditch Company and others, and, The Finney County Water Users' Association against the Coler Ditch and Reservoir Company of Colorado and others, as whatever rights it or others in either of the states of Colorado and Kansas may have to the use of said waters are indissolubly linked with those of the state in which they may be in the equitable apportionment of said water.

(Eight.)

It is further considered, ordered and decreed that the state of Colorado and the state of Kansas and each of them and their officers, agents, representatives and employees be and they are hereby severally perpetually enjoined from diverting, taking and using any water from the Arkansas River and its tributaries in excess of the amounts herein awarded to them.

(Nine.)

And it is further considered, ordered and decreed that the costs of this suit be apportioned among and paid as follows: The State of Colorado shall pay its own costs and

the State of Kansas and the defendant The Finney County Water Users' Association shall pay their own costs.

Dated —, 1943.

———,

Chief Justice of the Supreme Court of the United States.

Certificate of Special Master.

I certify that volumes 1 to 36 inclusive of the testimony and the exhibits, Colorado's exhibits 1 to 189 inclusive, and Kansas' exhibits 1 to 129 were taken before the Stenographic Commissioner William S. Atwood, and were delivered to me by him, and volumes 37 to 39 inclusive of the testimony and Colorado's exhibits 190 to 216 inclusive and Kansas' exhibits 130 to 135 inclusive were admitted in evidence and taken before me as Special Master, are the records and admitted in the case of the *State of Colorado* v. *The State of Kansas* and transmitted to the Clerk of the Supreme Court of the United States.

Dated May 1, 1943.

———,

Special Master.

No. 5 Original

In the

Supreme Court of the United States

OCTOBER TERM, A. D. 1942

THE STATE OF COLORADO, COMPLAINANT,

v.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, DEFENDANTS.

EXCEPTIONS OF COMPLAINANT, THE STATE OF COLORADO TO THE REPORT, THE FINDINGS OF FACT, THE CONCLUSIONS OF LAW, AND THE RECOMMENDED DECREE OF THE SPECIAL MASTER.

GAIL L. IRELAND,
Attorney General,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,
Special Counsel.

PEERLESS PRINTING COMPANY DENVER

In the

Supreme Court of the United States

OCTOBER TERM, A. D. 1942

No. 5 Original

THE STATE OF COLORADO, COMPLAINANT,

v.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, DEFENDANTS.

EXCEPTIONS OF COMPLAINANT, THE STATE OF COLORADO, TO THE REPORT, THE FINDINGS OF FACT, THE CONCLUSIONS OF LAW, AND THE RECOMMENDED DECREE OF THE SPECIAL MASTER.

The State of Colorado, complainant above named, by Gail L. Ireland, Esq., its Attorney General, who acts in its behalf at the request and by the direction of the Honorable John C. Vivian, its Governor, objects and excepts to the Report, the Findings of Fact, the Conclusions of Law, and the Recommended Decree of the Special Master heretofore filed herein on May 24, 1943, as follows:

I.

Complainant excepts to the determination or recommendation of the Master on page 2 of the Report under the heading, "Established Principle Applicable in a Suit Between States Involving Interstate Waters", that an

equitable apportionment of the water supply and flow of the Arkansas River and its tributaries as between the State of Colorado and the State of Kansas should be made; and as grounds therefor says:

(a) Any apportionment of the waters of an interstate stream requires the placing of a limitation or restriction on the upper state—in this case Complainant, State of Colorado, and hence amounts to an impairment of the quasi-sovereignty of that state to the extent of such restriction or limitation;

(b) No decree will be entered against a state (in this case Colorado) upon the suit of another state (in this case Kansas) unless there is a showing by clear and convincing evidence that the state which claims to be aggrieved (in this case Kansas) has suffered an injury of serious magnitude;

(c) There is no showing in this case that the State of Kansas has suffered, or is threatened with, an injury of serious magnitude, or any injury whatsoever;

(d) There is no showing that the State of Kansas has utilized, or now does utilize, fully the water supply of the Arkansas River which in the past has been, and now is, available to it and its water users.

II.

Under the decision of this Court in the original case of *Kansas v. Colorado*, 206 U. S. 46, no decree can be entered for the State of Kansas in this case unless it shall appear that through a material increase in the depletion of the waters of the Arkansas River by Colorado the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits from the water supply and flow of the Arkansas River and its tributaries between the State of Colorado and the State of Kansas. There is no finding, or evidence to support a finding, that the substantial interests of the State of Kansas have been so injured.

III.

Complainant excepts to Finding of Fact "Five", on page 9 of the Report, that since the taking of testimony in the former case of *Kansas v. Colorado*, 206 U. S. 46, there has been a material increase in the depletion by Colorado of the water supply of the Arkansas River, which has diminished the flow of water into the State of Kansas, to the injury of the substantial interests in Kansas, and says:

(a) The Master does not find, and the evidence will not sustain a finding, that there has been a material increase in the depletion by Colorado and its water users of the supply of the river. On the contrary the evidence shows that since 1907 the amount of divertible and usable water flowing across the Colorado-Kansas State line during the irrigation season (April-September) has been increased in average annual quantities. (By "divertible" is meant stream flows within the capacity of the existing Kansas ditches; by "usable" is meant divertible stream flows that reach the headgates of the Kansas ditches at times when they can be beneficially used for irrigation.)

(b) The Master finds no facts, and can find none from the record, to sustain a finding that there has been any injury to the substantial interests of Kansas, because the record shows that since 1907:

1. The irrigated acreage in Kansas has increased substantially;
2. The irrigated acreage in Kansas has increased proportionately to a far greater extent than the irrigated acreage in Colorado;
3. Diversions of water for irrigation in Kansas have greatly increased;
4. Agricultural production in Kansas has not suffered from any use of water of the Arkansas River in Colorado;

5. The use of water in Kansas for domestic or industrial purposes have not been adversely affected by any water uses made in Colorado;

6. There has been no loss in population or any adverse effect on the welfare of the State of Kansas or its citizens resulting from any use of the waters of the Arkansas River made in Colorado.

7. There has been a greater development and increase in prosperity of the Arkansas River basin in Kansas than in the Arkansas River basin in Colorado.

IV.

Complainant excepts to Finding of Fact numbered "Six" on page 10 of the Report that, "The average annual natural flow of the river and its tributaries is 1,240,000 acre-feet of which the average annual dependable and fairly continuous water supply and flow of the Arkansas River and its tributaries is 1,110,000 acre-feet" and says:

(a) The amounts stated are based upon estimates and are not, have not been, and cannot be, measured. The water supply of the Arkansas River is capable of measurement only when it is collected in a stream channel. The Master finds and recommends (pages 12, 16 and 21) that measuring points or stream gauging stations be established and maintained at Canon City and at the mouth of the Purgatoire River. Stream gauging stations have been maintained at both these points for many years. For the period 1908-1938 the annual flow at Canon City, adjusted for by-passed and imported water, was 573,964 acre-feet and for the same period the flow at the mouth of the Purgatoire was 96,416 acre-feet, or a total for both stations of 670,380 acre-feet.

(b) The phrase "average annual natural flow" is

meaningless without some definition of the word "natural";

(c) The phrase "average annual dependable and fairly continuous water supply" is meaningless without some definition of the word "dependable" and of the phrase "fairly continuous";

(d) All references to the amounts of the "average annual natural flow" and the "average annual dependable flow" are meaningless unless such amounts are capable of accurate measurement. The Master does not find, and from the record cannot find, any method whatever for the accurate measurement of such flows;

(e) The amounts found by the Master are incapable of accurate measurement and hence they do not, and cannot, constitute any basis for any workable apportionment of the waters of the stream between the two states;

(f) The Master's finding of "dependable and fairly continuous water supply and flow" is inconsistent with Findings of Fact "Second" and "Third" (pages 5 and 6 of the Report) to the effect that, "The character of the flow of the river in Colorado is variable from year to year and season to season and day to day," and, "The character of the flow of the river in Colorado is widely variable from year to year and season to season, and its general flow divides itself into three groups or kinds of flow, namely: First, the perennial flow from the high mountains consisting of melting snows in the mountains, varying almost from day to day Second, the intermittent flow, resulting from intense rainstorms on plains area, and, Third, a more or less constant flow varying slightly from year to year and from month to month due to return seepage from irrigated lands."

V.

Complainant excepts to Finding of Fact "Seven",

(page 10 of the Report) to the effect that the use of water in Colorado has "resulted in the diminution of the yearly average flow at the state line", for the reason that:

(a) There is no evidence to support such a finding;

(b) The evidence shows that since 1907 the amount of divertible and usable water flowing across the State line during the irrigation season has not been decreased.

VI.

Complainant excepts to the apportionment of water between the States of Colorado and Kansas as stated in Findings of Fact "Eight" and "Nine", Conclusions of Law "Two" and "Three", and Recommended Decree paragraphs "One" and "Two" (pages 10, 11, 14, 15, 19 and 20 of the Report), for the reasons that:

(a) The amount of water awarded to Kansas (185,000 acre-feet annually) is greatly in excess of the requirements of Kansas for land now under irrigation;

(b) The imposition of an obligation on Colorado to deliver to Kansas 185,000 acre-feet annually will inevitably result in there being withdrawn from irrigation in Colorado many thousands of acres of land. The Special Master finds (Finding "Six", page 10 of the Report) that "Both states have appropriated all of the natural flow of the Arkansas River and its tributaries" and further finds (Finding "Nine", page 11 of the Report) that there should be awarded and delivered to Kansas 185,000 acre-feet annually of "the average annual dependable water supply and flow of the river stream for * * * lands now being irrigated, and for lands to be irrigated, and lands irrigated from the waters of the Arkansas River prior to the time the State of Colorado increased her development in irrigation". Since the Master finds that the stream is over appropriated and awards Kansas water for lands not now irrigated, it is obvious that if Kansas is to irrigate additional lands there must necessarily fol-

low a decline in the Colorado irrigated acreage and the abandonment of irrigation systems now in existence including the abandonment of substantial portions of irrigation systems in existence in 1907. This result is contrary to the well-established principle that in the apportionment between states of the water of an interstate stream existing economic development must be protected whenever it is possible so to do.

(c) The Master's report does not limit, nor make any finding of, the amount of lands in Kansas "to be irrigated" or of the amount of "lands irrigated from the waters of the Arkansas River prior to the time the State of Colorado increased her development in irrigation". Without a specific or definite finding of the amount of these lands there can be no proper determination or definition of the amount of water necessary for irrigation in Kansas.

(d) The Master purports to consider, among other things, "proper requirements of transportation of the water and an economical use of water" (Finding "Six", page 40 of the Report) but makes no specific finding, or any finding, as to what is a proper requirement of transportation of the water nor as to what constitutes an economical use of the water;

(e) The plan or scheme of apportionment recommended by the Master is unworkable because:

1. No standard is established from which the proportionate shares of the two states may be determined;
2. The apportionment to Kansas is divided into summer and winter flows. No such division is made for Colorado. Consequently, no proportionate division, except as to annual flows, can possibly be made under the Recommended Decree.
3. Until the end of each annual period (or summer season and winter season) it cannot be

known with any certainty whether one state or the other has exceeded its apportionment. Since the water supply is produced by nature and not by the efforts of man, it is impossible to forecast the amount of the supply for any year or for any season or for any month or for any day. There is no existing engineering or scientific knowledge which will enable any administrator of the stream to keep the amounts awarded to each state in balance;

4. The Master finds the flow erratic, intermittent, varying from year to year, season to season, and day to day. Such conditions require that in any scheme or plan of apportionment between the two states of Kansas and Colorado, there must be provision for an allowance of debits and credits for under or over deliveries in order that such plan be workable;

5. The only fair, equitable and workable apportionment between these states of the flow of the interstate stream is to require Colorado to deliver at the State line an amount of water properly related to water production and fairly adjusted to compensate for the variability of flow and losses in transit and then to permit Colorado to use the supply not required to make such deliveries to Kansas.

(f) There is patent uncertainty as to meaning and effect in paragraph "Two" of the Recommended Decree (page 20) of the phrase "at such times and in such amounts as and when required by water officials of the State of Kansas".

1. Deliveries or flows to Kansas must necessarily be affected by and taken upon the conditions of the flow as produced by nature;

2. If the phrase above quoted could be construed to apply to water to be delivered during the

summer season (April-September), then this paragraph "Two" of the Decree conflicts with paragraph "Nine" of the Findings of Fact (page 11) and paragraph "Two" (page 14) of the Conclusions of Law, where it is clearly stated that the above quoted phrase applies only to water for the winter season (October to April) and further conflicts with the provision of paragraph "Nine" of Findings of Fact which, in referring to the winter flow, says, "as the same could be delivered for irrigation or storage";

3. The application of the quoted phrase to either the winter or summer water, or to both, conflicts and is inconsistent with the findings as to the character of the flow of the river being "variable from year to year and season to season and day to day and the main river at any one point may be almost without water one day and have a flood in it the next day and the following day have practically its original condition" (paragraph "Second" of Findings of Fact, page 5 of the Report);

4. To require such a variable flow to be delivered at the times and in the amounts demanded by Kansas officials is to require Colorado to do the impossible.

VII.

Complainant excepts to the Findings and Conclusions and Recommended Decree relating to "flood waters" (Paragraph "Ten", page 11, Findings of Fact; Paragraph "Four", page 15, Conclusions of Law; Paragraph "Three", page 20, Recommended Decree) because the nature of flood waters and their place of occurrence is such that any attempt to measure, control or apportion them must fail unless there are constructed numerous flood con-

trol reservoirs of a permanent nature where such waters may be conserved and not merely temporarily retarded.

VIII.

Complainant further excepts to the plan and details of the attempted apportionment because:

(a) The legal theory of such apportionment is wrong. Since Colorado is the upper state, water can obviously be delivered to it only by nature. The production and use and delivery of water occurs throughout the entire basin of the river in Colorado and in almost innumerable channels or streams;

(b) The Master in paragraphs "One" and "Two" of the recommended Decree (Pages 19, 20 of the Report) says, with reference to the respective states—"is awarded, granted and decreed to be the owner and entitled to the use of water". The concept of ownership of water by a state is wrong as water flowing in a natural stream is not subject to true proprietary ownership. The correct rule is that waters of non-navigable streams are *publici juris*, subject to the plenary control of the respective states through which the stream flows.

IX.

Complainant excepts to paragraph "Nine" of the Conclusions of Law (page 17) and to paragraph "Eight" of the Recommended Decree (page 22) to the effect that the states, their officials and representatives are "hereby severally perpetually enjoined from diverting, taking and using any water from the Arkansas River and its tributaries in excess of the amounts herein awarded to them." As applied to complainant, the State of Colorado, particularly, the use of the term "diverted", in the view of one cognizant of irrigation practices, means the measure of the water at the headgate. If such meaning is given to the paragraph above quoted, it is inconsistent with

paragraphs "One" and "Two" of the Recommended Decree which grant specific amounts of water to the respective states. The measuring of a State supply at the headgates is unsound so far as an upper state is concerned for the reason that such procedure eliminates from consideration the return flows which admittedly exist and are recognized by the Master in his Finding of Fact "Third" (Page 7, of the Report). The only true measure of stream depletion by an upper state or water user is consumptive use—that is, diversions less returns to the river—and such measure, generally accepted throughout the West, should be recognized in any apportionment as between the states and in any decree providing for such apportionment.

X.

Complainant excepts to the provisions of the Findings of Fact, Conclusions of Law and Recommended Decree for establishment and maintenance of stream gauging stations (Findings paragraph "Twelve", page 12; Conclusions paragraph "Five", page 16; Decree paragraph "Four", page 21), for the reasons that:

(a) There have been established and maintained by complainant, State of Colorado, stream gauging stations at Canon City since 1888, at a point near the mouth of the Purgatoire since 1906, and at the State line since 1908. The establishment and maintenance of additional or duplicate stations is unnecessary;

(b) No provision is made for the adjustment of the recorded flow at the Canon City station for by-passed and imported water. (By-passed water is water which would have flowed by and been measured at the station except for the fact that it was diverted above and conveyed around the station; imported water is water which has been brought into the Arkansas River basin from the basin of another river—in this case, the Colorado River.) Such imported water results from the construction in Colorado of large and ex-

pensive transmountain diversion systems by private enterprises at their own cost. To require a portion of this imported water to be delivered to Kansas is to deprive the private enterprises owning the right to use such water of their property without due process of law, in violation of Articles V and XIV of the Amendments to the Constitution of the United States. None of the owners of such imported water are parties to this case;

(c) No provision is made for measurement at the Colorado-Kansas State line except of water flowing in the river channel itself. The undisputed evidence shows that water belonging to the Arkansas River basin in Colorado crosses the State line into Kansas in other channels than that of the main river itself, as for instance the so-called "Holly Drain", and Colorado should receive credit for delivery to Kansas of water crossing the State line in these channels as well as in the main river channel itself.

XI.

Complainant excepts to Conclusion of Law, "Six" (page 16) and paragraph "Five" (page 21) of the Recommended Decree reading: "The states of Colorado and Kansas are not denied the right to assert their claim in the present suit of an equitable proportion of the waters flowing in the Arkansas River and its tributaries" and "The states of Colorado and Kansas are granted the right in the present suit to assert their respective rights and claims of an equitable apportionment of the waters in the Arkansas River and its tributaries", for the reason that these provisions are meaningless in view of the fact that the Master has attempted to make an equitable apportionment of the waters of the Arkansas River between the states and the quoted sentences may be construed to mean that the respective states are granted the right to reopen the present suit for assertion of further rights and claims. Said provisions are likewise inconsistent and in conflict

with the decision of this Court in the case of *Kansas v. Colorado*, 206 U. S. page 46, by which the State of Kansas was relegated as to assertion of any such claims to a new proceeding "whenever it shall appear that through a material increase in the depletion of the waters of the Arkansas River by Colorado the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states".

XII.

Complainant excepts to the Findings of Fact, Conclusions of Law, and Recommended Decree with reference to the so-called Caddoa Reservoir (Findings, paragraph "Thirteen", page 13; Conclusions, paragraph "Seven", page 16; and Decree, paragraph "Six", page 21), because;

> Although, as found by the Master, the construction of Caddoa Reservoir by the United States government may not be "binding" on either of the states of Colorado or Kansas, nevertheless the reservoir is in existence. It is located on the main channel of the Arkansas River about 50 miles west of and above the Colorado-Kansas State line. The impounding therein and release therefrom of water is under the control of the Corps of Engineers of the United States Army. Obviously such impounding and release of water will have a direct effect upon the flow of the water crossing the State line. The State of Colorado has no control over the actions of the Corps of Engineers. The United States is not a party to this case and cannot be made a party by either state.

XIII.

Complainant excepts to the Findings of Fact, Conclusions of Law and Recommended Decree of the Master with reference to the 1933 Stipulation between the officials and counsel for the Complainant and Defendants (Findings, Paragraph Thirteen, page 13; Conclusions, Paragraph

"Seven", page 16; and Decree, Paragraph "Six", page 21) because:

"(a) Such stipulation was not, as found by the Master, entered into after the construction of Caddoa Reservoir, but on the contrary was entered into long before the construction of said reservoir— on December 18, 1933. Construction of Caddoa Reservoir was not authorized until 1938 and construction was not actually commenced until 1939.

(b) The stipulation does not affect merely the water impounded in said reservoir as stated by the Master but refers to and affects the flow of the Arkansas River;

(c) The stipulation became effective when Caddoa dam and reservoir were constructed and water was impounded therein; not when it was completed;

(d) While it is true in fact that such stipulation was not ratified by the legislatures of the two states and was not consented to by the Congress of the United States and, hence, was not binding as an interstate compact, nevertheless that stipulation was signed by the governors of the respective states, their water officials and the respective counsel in this case, and by its terms defines the amount of water required to satisfy the then existing Kansas irrigation requirements in the views of those who signed the stipulation. The apportionment to Kansas of a greater amount of water than that stated in the stipulation, as is now recommended by the Master, constitutes an apportionment of water for future development and use, which may or may not take place. Since the stream is now over-appropriated, this apportionment to Kansas of more water than required to satisfy existing Kansas irrigation development must necessarily mean that some Colorado land now irrigated, and irrigated in 1907, will in the future be deprived of water in order to meet the Kansas requirement.

Such a result is directly contrary to the principle that existing economic development will be protected whenever possible.

XIV.

Complainant excepts to the failure of the Master to make any complete or accurate findings as to:

(a) The physical features of the Arkansas River basin in Colorado and Kansas;

(b) The location, extent, character, history and development of the irrigated areas in the two states;

(c) The nature and availability of the water supply;

(d) The natural conveyance losses of water in the Arkansas River and its tributaries;

(e) The effect of Caddoa Reservoir on the regimen of the stream flow;

(f) The status established by the decision in *Kansas v. Colorado*, 206 U. S. 46, and the determination and adjudication therein that up to that time (1907) Colorado had not exceeded its share of equitable benefits;

(g) The water supply of the Arkansas River basin in Kansas;

(h) The imperative need of irrigation for the production of crops on land now under cultivation in Colorado;

(i) The expensive facilities constructed by Colorado water users to develop storage and to conserve water for beneficial use and the failure of Kansas in that respect;

(j) The availability, feasibility and actual development of water for irrigation by pumping enterprises in Kansas.

XV.

Complainant excepts to the failure of the Master to make any finding as to, or to give any consideration to or, in fact, to mention, the 1916 settlement between certain Colorado water users and the Garden City group of Kansas ditches (the Kansas irrigation ditches may be divided into the Garden City group and the State line group, of which the Garden City group is much the larger and more important) or the rotation agreement and decree between the Garden City group of Kansas ditches (including the defendant, The Finney County Water Users' Association) because the undisputed evidence shows:

(a) In 1916 all the Kansas ditches and water users of the Garden City group, except the Farmers' Ditch of the defendant herein, The Finney County Water Users' Association, settled certain cases theretofore brought in the United States District Court for the District of Colorado by the United States Irrigation Company, which is not the predecessor in interest of the defendant The Finney County Water Users' Association as found by the Master in Finding of Facts "Fourth", to assert certain priorities in its behalf as against a large number of Colorado water users. Under this agreement the Colorado ditches and water users paid to the Kansas ditches approximately $150,000 and the Kansas ditches in turn agreed not to assert any claim or demands to priorities as of a date earlier than August 27, 1910;

(b) By agreement and decree the Garden City group of ditches, including the Farmers Ditch of the defendant The Finney County Water Users' Association, rotate the water supply from the Arkansas River. To protect existing economic development, recognition should be given to the Kansas rotation agreement and to the priority date agreed to by the Kansas ditches in and by the 1916 settlement.

XVI.

Complainant excepts to the report of the Master as a whole and to the Findings of Fact, Conclusions of Law and Recommended Decree as a whole, because:

(a) It reflects a misconception of the problems inherent in the practical administration of the waters of the Arkansas River and is wholly inequitable, impractical and unworkable;

(b) No recognition is given the principle of beneficial use since gross amounts of water are awarded to the respective states without consideration as to whether or not the water is, or can be or will be, applied to a beneficial use;

(c) The awarding to Kansas of a quantity of water not now needed by irrigation development in that state, but imperatively required for irrigation in Colorado, is in fact a reshuffling of economic development along the river without regard to the effect thereof upon the public welfare or upon existing development;

(d) The Master considers and treats the situation as if the only question involved were the division of a certain amount of water available at all times and easily susceptible of measurement. Actually the problem is much more complex. The public welfare requires that there be the greatest possible utilization and conservation of the water supply of the Arkansas River. To meet these requirements an apportionment of water between the two states must be equitable, flexible and feasible of administration, and must to the fullest extent possible under the present development of engineering science and irrigation practice, provide for the distribution, use and re-use of an erratic and limited water supply so that it be not wasted.

XVII.

The Findings of Fact are contrary to the evidence.

XVIII.

The Conclusions of Law are contrary to the law and the evidence.

XIX.

The Recommended Decree is in conflict with the Findings of Fact, and the Conclusions of Law, and is contrary to the evidence and to the Law.

Respectfully submitted,

GAIL L. IRELAND,
Attorney General,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,

Special Counsel.

FILE COPY

SEP 15
CHARLES ELMORE CROPLEY

No. 5 Original

IN THE

Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

BRIEF FOR COMPLAINANT, THE STATE OF COLORADO.

GAIL L. IRELAND,
Attorney General
of the State of Colorado,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant
Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,
Special Counsel for Complainant.

PEERLESS PRINTING COMPANY, DENVER

SUBJECT INDEX

PAGE

JURISDICTION 1

STATEMENT OF FACTS 1

(1) In general 2

(2) Physical features of Arkansas River Basin 4

(3) The former case between Kansas and Colorado .. 7

(4) The interstate controversy since the 1907 decision in *Kansas v. Colorado* 10

(a) Kansas rotation agreement 11

(b) The 1916 settlement 11

(c) The suits brought by the Finney County Water Users' Association 13

(5) The pleadings in the case at bar 13

(a) The complaint 13

(b) The answer of the State of Kansas 16

(c) Answer of the Finney County Waters Users' Association 17

(d) Reply of the State of Colorado 18

(e) The issues as defined by the pleadings 19

(6) The evidence 19

(7) The stipulation of 1933 20

(8) Caddoa Reservoir 22

SPECIFICATION OF POINTS TO BE URGED .. 22

SUMMARY OF THE ARGUMENT 23

ARGUMENT 28

INDEX—(Continued)

PAGE

(1) The injunction sought by Colorado against the further prosecution of the Finney County cases should be granted 28

(2) There is no showing that through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of the benefits between the two states resulting from the flow of the river..... 28

(a) To maintain its cross-bill Kansas must sustain the burden of showing (1) That since the decision in *Kansas v. Colorado* there has been a material increase in the depletion of the waters of the river by Colorado and its water users and (2) that this has resulted in injury to the substantial interests of Kansas..... 28

(b) There has been no material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, since the decision in *Kansas v. Colorado*..... 32

(i) The records of Colorado diversions and return flows show conclusively that since 1907 Colorado has not increased materially the depletion of the flow of the stream 32

(ii) Since the decision in *Kansas v. Colorado* there has been no diminution in the amount of state line flow divertible and usable for irrigation in Kansas..... 34

(iii) Since the decision in *Kansas v. Colorado* the quantities of water diverted and used by the Kansas irrigation ditches have materially increased 41

INDEX—(Continued)

PAGE

(c) There has been no injury to the substantial interests of Kansas 44

(i) Population 45

(ii) Agricultural production 46

(iii) Irrigated acreage 47

(iv) The great body of the valley in Kansas has not been injured 49

(d) Since Kansas has not been injured, no affirmative decree should be entered against Colorado under the cross-bill 52

(e) The finding of the Special Master as to stream depletion and injury is contrary to the evidence and the law and should not be accepted or followed by the Court 54

(3) The report of the Special Master is so ambiguous, inconsistent and confusing that it is impossible to determine how much water is apportioned to each state and how the stream is to be administered to effectuate such an apportionment 56

(a) The Master misconceives the problems inherent in an apportionment between states of a fluctuating water supply such as that of the Arkansas River 56

(b) The findings of the Master with relation to the water supply are based upon estimates and are of no practical value 61

(c) The recommendations of the Master as to measuring stations reflect a misconception of the existing conditions 62

(d) The recommendations of the Master as to the proportionate division between states are uncertain 65

INDEX—(Continued)

PAGE

(e) The recommendations of the Master with relation to flood waters are uncertain and afford no workable plan for the apportionment of such flood waters 66

(f) The Master's recommended decree conflicts with his findings of fact and conclusions of law as to the delivery of water and is unworkable and grossly unfair to the State of Colorado 68

(4) The apportionment recommended by the Master allocates to Kansas more than its equitable share of the benefits of the flow of the interstate stream. 70

(a) The nature of equitable apportionment 70

(b) The report of the master shows on its face that the recommended apportionment would result in taking water from established Colorado uses for Kansas lands that are not now irrigated 74

(c) The award of water to Kansas for use in possible future development is improper as it constitutes the recognition of an inchoate right 75

(d) The award recommended to be made to Kansas is excessive since Kansas is not now making full use of the water which it has 76

(e) The recommended apportionment is inequitable since it utterly disregards the 1916 settlement and the stipulation of 1933 77

(i) The 1916 settlement 77

(ii) The 1933 stipulation 79

(f) The recommended apportionment would require Colorado to forego present uses in order to deliver water to Kansas at the state line 80

INDEX—(Continued)

PAGE

(i) Under historical conditions substantial deficiencies would have occurred in state line flows if the recommendation of the Master as interpreted by Kansas had been in effect 81

(ii) There is no relationship between the so-called Index flows and the state line flow.. 85

(g) While Kansas claims additional water from Colorado for irrigation, the Kansas law is such that there is no assurance that additional water can or will be so used 87

(5) The existence and effect of Caddoa Reservoir on the regimen of the flow of the stream must be recognized 89

(a) A description of Caddoa Reservoir..... 89

(b) The Master ignores the effect of Caddoa Reservoir 90

(c) The stipulation of 1933 affords a basis of using Caddoa Reservoir to preserve the existing use and to divide equally the potential conservation benefits 91

(6) In numerous minor matters the report of the Master is either incomplete or incorrect and hence should not be accepted..... 96

(a) The provisions of the recommended decree that the states each own certain quantities of water is erroneous..... 96

(b) A decree should not require the measurement of Colorado ditch diversions..... 97

(c) The findings of the Master are incomplete in many particulars 99

INDEX—(Continued)

PAGE

(7.) The defendants' exceptions to the report and recommendations of the Special Master amount to an attempt to rewrite the report and are without support in the evidence and are unfair to Colorado 100

(a) The defendants' theory of rewriting the report and decree with changes favorable to their interests is wrong in theory and unsupported by the evidence and the law..... 100

(b) The scheme of apportionment contained in the Kansas exceptions is inequitable..... 101

(c) The Kansas theory ignores the question of conveyance losses between the index stations and state line..... 102

(d) Kansas is inconsistent in claiming a percentage of the index flows as they accrue and in also claiming that the water be delivered when required 103

(e) The Kansas position with relation to flood water is unfair..... 103

(8) If a decree of apportionment is to be made it should follow the 1933 stipulation..... 104

CONCLUSION 106

INDEX—(Continued)

TABLE OF AUTHORITIES.

CASES:	PAGE
Alabama v. Arizona, 291 U. S. 286, 291	32, 72
Arizona v. California, 283 U. S. 423, 462	71
Arizona v. California, 298 U. S. 558, 565	97
Bean v. Morris, 221 U. S. 485	29
California-Oregon Power Company v. Beaver Portland Cement Company, 295 U. S. 142, 163-164	90, 97
Connecticut v. Massachusetts, 282 U. S. 660, 670	32, 44, 54, 70
Frizell v. Bindley, 144 Kan. 84	87
Hinderlider v. La Plata River and Cherry Creek Ditch Company, 304 U. S. 92, 104-105	28, 29
Holmes v. Rowe, 97 F. (2d) 537	29
Iowa v. Illinois, 202 U. S. 59	105
Kansas v. Colorado, 206 U. S. 46	2, 4, 6, 10, 13, 14, 15, 17, 19, 23, 28, 31, 32, 45, 52, 70
Louisiana v. Texas, 176 U. S. 1, 23	95
Massachusetts v. Missouri, 308 U. S. 1, 15	72
Minnesota v. Wisconsin, 252 U. S. 273, 283	106
Missouri v. Illinois, 200 U. S. 496, 521	32
Missouri v. Nebraska, 197 U. S. 577	105
Nebraska v. Iowa, 145 U. S. 519	105
Nebraska v. Wyoming, 295 U. S. 40, 43	28, 79, 97
New Jersey v. New York, 283 U. S. 336, 342	71
New York v. New Jersey, 256 U. S. 296, 309, 313	32, 106
North Dakota v. Minnesota, 263 U. S. 365, 374	32
Oklahoma v. Texas, 265 U. S. 500	55

INDEX—(Continued)

PAGE

Rickey Land and Cattle Company v. Miller and Lux, 218 U. S. 258 29

Schooner Exchange v. McFadden, 7 Cranch 116, 136 .. 53

Smith v. Miller, 147 Kan. 40, 42 88

Tyler v. Wilkinson, 4 Mason 397, 400 97

United States v. Appalachian Power Co., 311 U. S. 377, 405, 423 ..... 90, 100

United States v. West Virginia, 295 U. S. 463, 474 72

Virginia v. West Virginia, 246 U. S. 565, 591 29

Virginia v. West Virginia, 220 U. S. 1, 36 55

Washington v. Oregon, 297 U. S. 517, 529 ..... 32, 71

Washington v. Oregon, 214 U. S. 205 106

Weiland v. Pioneer Irrigation Company, 259 U. S. 498 29

Wyoming v. Colorado, 259 U. S. 419, 468, 480 ..... 28, 72, 77, 78, 81

CONSTITUTIONS AND STATUTES:

Boulder Canyon Project Act, 45 Stat. 1057 64

Boulder Canyon Project Adjustment Act, 54 Stat. 774 64

Colorado River Compact, H. D. 605, 67th Cong., 4th Sess., Colorado Session Laws 1923, Chap. 189 ..... 64, 81, 106

Flood Control Act of June 22, 1936, 49 Stat. 1570 ..... 22, 89

Flood Control Act of 1938, 52 Stat. 1215 ..... 22, 89

John Martin Reservoir Project, 54 Stat. 503-508 22

Kansas Laws of 1886, Ch. 115, R. S. 42-101 87

La Plata River Compact, 43 Stat. 796 106

Red River Compact, 52 Stat. 150 106

INDEX—(Continued)

PAGE

Republican River Compact, 78th Cong., Ch. 104, Public Law 60 106

Rio Grande Compact, 53 Stat. 785 ..... 81, 106

South Platte River Compact, 44 Stat. 195 106

United States Constitution, Art. III, Sec. 2, Cl. 2 1

TEXTS AND MISCELLANEOUS:

The Compact Clause of the Constitution—A Study in Interstate Adjustment, Vol. 34, Yale Law Journal 99

Federal Recl. Laws Annotated, 1936 Ed. p. 399, Decision M-28389 64

Hearings before the Committee on Flood Control, House of Representatives, Seventy-Fifth Congress, Third Session, March 30 to April 19, 1938, pp. 704-706, 733-950 91

1 Kinney on Irrigation, 2nd Ed. 656 97

National Resources Planning Board Technical Paper No. 5 "Interstate Water Compacts, 1785-1941" ... 106

21 Opinions Attorney General 274 53

Restatement of the Law of Torts 73

Selected Problems in the Law of Water Rights in the West, Misc. Publication No. 418, U. S. Department of Agriculture 88

1 Wiel on Water Rights, 3d Ed. 197 97

In The

Supreme Court of the United States

October Term, 1942

No. 5 Original

The State of Colorado, Complainant,

vs.

The State of Kansas and The Finney County Water Users' Association, a Corporation, Defendants.

BRIEF FOR COMPLAINANT, THE STATE OF COLORADO.

JURISDICTION

This is an action between States. Original jurisdiction is invoked under Article III, Sec. 2, Cl. 2, of the Constitution of the United States and Section 233 of the Judicial Code (28 U.S.C.A. Sec. 341). Leave to file the Bill of Complaint was granted January 3, 1928 (275 U. S. 511, 48 S. Ct. 204).

STATEMENT OF FACTS

This matter is before the Court on exceptions which have been filed by all the parties to the Report and Recommendations of the Special Master. The controversy involves the use for irrigation purposes of water of an interstate stream, the Arkansas river. In Colorado the appropriation system of water law applies. Kansas adheres to the riparian system except possibly as to certain lands in its western

counties where appropriation rights are allegedly recognized.

1. In General.

To protect its rights as fixed and determined by the judgment of this Court in *Kansas v. Colorado*, 206 U. S. 46, 27 S. Ct. 655, Colorado brought this suit against Kansas and a private corporation, The Finney County Water Users' Association. The complaint is in the nature of a bill of peace and the relief sought is: (a) An injunction against The Finney County Water Users' Association forbidding the further prosecution of two suits brought by that Association in the United States District Court for the District of Colorado against citizens of Colorado using water of the Arkansas river and its tributaries; and (b) Protection of the rights of Colorado and its citizens in the waters of the Arkansas river and its tributaries, as fixed and determined by this Court in the case of *Kansas v. Colorado, supra*, from further harassment by Kansas and its citizens.

The defendants filed a motion to dismiss which was denied "without prejudice to any question" (278 U. S. 574, 49 S. Ct. 92). Subsequently the defendants filed answers and cross-bills praying for an adjudication of their rights to Arkansas river water. It was ordered that testimony be taken before a stenographic commissioner, and over a period of several years at numerous hearings testimony was so taken, and many exhibits were introduced. After both parties had rested, Colorado filed a motion for the appointment of a Special Master and for permission to introduce further testimony. On May 4, 1942, the Court appointed the Honorable Charles C. Cavanah Special Master and referred to him the motion for introduction of further testimony. The Court ordered (316 U. S. 645, 62 S. Ct. 1102):

> "The Master is directed to examine the evidence already taken in the cause and any further evidence that may be taken, to make findings of fact and con-

clusions of law, and to submit the same to this Court with all convenient speed, together with his recommendations for a decree. The findings, conclusions and recommendations of the Master shall be subject to consideration, revision, or approval by the Court."

The Master permitted the taking of additional testimony (Report p. 2). After two hearings, the presentation of briefs, and oral arguments, the Master made his Report. Pursuant to the order of this Court entered May 24, 1943, exceptions to the Report have been filed by all parties.

To summarize the Master's report, he found in favor of Colorado on the question of the injunction against the further prosecution of the pending lower federal court cases mentioned in the complaint. The defendants have filed no exceptions to his action in this regard. The Master then found in favor of Kansas on the issue presented by the cross-bill and proceeded to recommend an apportionment of the water supply between the states. Colorado has excepted to the finding and conclusion that an apportionment is necessary. All parties have excepted to the recommended plan of apportionment.

The Court has indicated through its Clerk that it would not require the printing of the voluminous record in this cause. Consequently, no designations have been filed, and none of the record is printed. The determination of many of the exceptions of Colorado requires no reference to the record as the points raised clearly appear on the face of the Report of the Master. In order that the Court might have available a condensed statement of those factual matters which Colorado believes of importance and in order that this brief may be not unduly lengthened, the complainant is submitting herewith, as Appendix A, a review of the evidence. There are in the record as exhibits many maps, graphs, compilations of statistics, and engineering analyses. Appendix B submitted herewith contains reproductions of what the complainant deems important exhibits.

2. Physical Features of Arkansas River Basin.

The Arkansas river has its headwaters high in the Rocky Mountains of central Colorado. For about 130 miles by river, in its course through Lake, Chaffee and western Fremont counties, it is a typical mountain torrent, descending rapidly with a gradient of 40 feet per mile (Colo. Ex. 9). It emerges from the mountains at the Royal Gorge, west of Canon City, flows across a foothill region to Pueblo, and thence traverses the high plains of Eastern Colorado. Across Kansas, the river takes a meandering course and leaves that state at the south central boundary to flow through Oklahoma and Arkansas and join the Mississippi near the southeastern corner of the latter state.

In its course through Colorado and Kansas, the Arkansas is non-navigable (Report p. 4).[1] The drainage area in Colorado is 24,628 square miles and in Kansas 22,195 square miles (Colo. Exs. 31, 205, Tr. p. 411). The river length in Colorado is 320 miles and in Kansas 390 miles (Report p. 5). The headwater branches of the Arkansas extend up to elevations of 10,000 to 14,000 feet above sea level (Tr. p. 347). At Canon City the altitude is 5,363 feet (Tr. p. 505); at the state line 3,345 feet (Tr. p. 506); and at the southern boundary of Kansas 1,000 feet (Tr. p. 506). At the crests of the mountain ranges the precipitation is from 20 to 30 inches annually, much of which is in the form of snow (Colo. Ex. 202, App. B, p. 52). The last mentioned exhibit shows that in the sheltered mountain valleys, as at Buena Vista and Salida, the annual precipitation is 10-12 inches, and that the precipitation increases across the plains from 11 inches at Pueblo and 14 inches at Lamar to 17 inches at Syracuse, Kansas, 18 inches at Garden City, Kansas and 19 inches at Dodge City, Kansas (App. A, p. 56). Temperature increases as one travels eastward from the mountains and in Kansas the average mean temperature is two to five degrees higher than in eastern Colorado (Colo. Ex. 191). Wind velocities

[1] This fact was conceded by the United States in its Petition in Intervention filed in *Kansas v. Colorado*, 206 U. S. 46, 54.

are higher in western Kansas than in eastern Colorado (Tr. p. 6690).

In Colorado the principal towns or cities located along the Arkansas after it leaves the mountains are, listed in down stream order with their populations as given in the 1940 census, Canon City 6,690, Pueblo 52,162, Rocky Ford 3,494, La Junta 7,040, Las Animas 3,232, Lamar 4,445, Holly 864; and in western Kansas in the Arkansas basin there are Syracuse 1,226, Garden City 6,285, and Dodge City 8,487. Approximately 150,000 people live in the cities, towns and villages of the Arkansas basin in Colorado and an additional 50,000 people are located on farms and agricultural lands (Complaint p. 7).

Irrigation has been practiced along the Arkansas in Colorado for over eighty years[2]. A summary of Kansas Ex. 2 (Tr. p. 908, App. A, pp. 67-72) shows the following adjudicated direct flow water rights in the main stem of the Arkansas river in Colorado.

Water Districts	Quantities in Cubic Feet per Second Senior[3] to 1894	1894 and Later	Combined Totals
11	363.02	31.07	394.09
12	521.43	27.23	548.66
14	2,024.44	7.00	2,031.44
17	2,399.60	401.72	2,801.32
67	1,552.35	87.20	1,639.55
Totals	6,860.84	554.22	7,415.06

The total decreed capacity of the approximately 200 storage reservoirs along the Arkansas and its tributaries in Colorado is 653,427 acre-feet.[4] Of this total capacity 589,018 acre-feet, or more than 90% bear dates senior to the year 1910 (App. A, p. 66).

The 1940 United States Census shows an irrigated

[2]The earliest priority is dated 1859 (Kans. Ex. 2).

[3]The significance of the date 1894 is that all direct flow ditches diverting from the main stem of the river were constructed prior to that year.

[4]This total is exclusive of the capacity of Caddoa reservoir, of the unavailable decreed capacity in the Great Plains reservoirs, and of conditionally decreed rights which have not been perfected by construction.

acreage in the Arkansas basin in Colorado of 469,535 acres (Tr. p. 6823, Colo. Ex. 196).

Construction of ditches in Kansas for irrigation from the Arkansas river began about 1880. There are eight ditches in Finney, Kearney and Hamilton counties, Kansas. Five of these in Finney and Kearney counties constitute what is known as the Garden City group and three in Hamilton county the Syracuse or state line group (Tr. pp. 3623-3635). There is but one storage reservoir for irrigation in western Kansas, Lake McKinnie which was constructed in 1907 or 1908 (Tr. p. 3704) and has a capacity of 25,800 acre-feet of which but about 18,000 acre-feet are used (Tr. p. 3313).

The Sixteenth U. S. Census for 1940 shows the irrigated acreage in Hamilton, Kearney and Finney counties Kansas to be 56,341 acres. All Kansas irrigation east of these counties is from wells or pumps and not from surface diversions from the river (Tr. p. 3546). Colorado witness Patterson testified that an investigation made under his supervision showed that in the three named Kansas counties the irrigated acreage was 59,632 of which only 22,428 acres were dependent exclusively on the surface flows of the Arkansas River, the remaining acreage having supplemental supplies by means of wells and pumps (Tr. p. 6561).

The physical conditions and the relative need for irrigation in the two states were thus summarized by this Court in its 1907 decision (*Kansas v. Colorado, supra,* p. 109):

> "It may be asked why cultivation in Colorado without irrigation may not have the same effect that has attended the cultivation in Kansas west of where it was productive when the territory was first settled. It may possibly have such effect to some degree, but it must be remembered that the land in Colorado is many hundred feet in elevation above that in Kansas; that large portions of it are absolutely destitute of sod, and that cultivation would have comparatively

little effect upon the retention of water. Add further the fact that the rainfall in Colorado is less than that in Kansas, and it would seem almost certain that reliance upon mere cultivation of the soil would not have anything like the effect in Colorado that it has had in Kansas, and that the barrenness which characterized portions of this territory of Colorado would have continued for an indefinite time unless relieved by irrigation."

3. The Former Case Between Kansas and Colorado.

The controversy between Kansas and Colorado over the Arkansas river is of long standing. In 1901 Kansas brought an original suit against Colorado and certain of its water users in this Court, alleging that Colorado had depleted the flow of the stream to the damage of the common law riparian rights of Kansas (206 U. S. 50-53, 85, 98). Colorado contended, among other things, that it had the right to use as it saw fit all the water of the stream within its borders (206 U. S. 85, 98). The United States intervened, asserting that the Federal government had the right to control the flow of interstate streams (206 U. S. 56-57, 85).

After the taking of voluminous testimony before a commissioner, this Court in 1907 handed down a decision which, as the first pronouncement of the rule of equitable apportionment, has long been recognized as a landmark in the field of interstate water controversies. After determining that it had jurisdiction of the case, the Court first disposed of the claim of national control adversely to the United States. This portion of the decision is concluded with the following statement (206 U. S. 93):

> "It is enough for the purposes of this case that each state has full jurisdiction over the lands within its borders, including the beds of streams and other waters."

The Court then reviewed the physical conditions in

the Arkansas river basin (206 U. S. 105-108). Tables of population, cultivated acreage and value of farm products in the Colorado section of the basin were given and the Court summarized the Colorado situation thus (206 U. S. 109):

> "These tables disclose a very marked development in the population, area of land cultivated, and amount of agricultural products. *Whatever has been effective in bringing about this development is certainly entitled to recognition, and should not be wantonly or unnecessarily destroyed or interfered with.*[5] That this development is largely owing to irrigation is something of which, from a consideration of the testimony, there can be no reasonable doubt. It has been a prime factor in securing this result, and before, at the instance of a sister state, *this effective cause of Colorado's development is destroyed or materially interfered with, it should be clear that such sister state has not merely some technical right, but also a right with a corresponding benefit.*"

Similar tables of population and farm production are given for Kansas, and the Court then said (206 U. S. 113):

> "These are official figures taken from the United States census reports, and they tend strongly to show that the withdrawal of the water in Colorado for purposes of irrigation has not proved a source of serious detriment to the Kansas counties along the Arkansas river. It is not strange that the western counties show the least development, for, being nearest the irrigation in Colorado, they would be most affected thereby. At one time there were some irrigating ditches in these western counties, which promised to be valuable in supplying water, and thus increasing the productiveness of the lands in the vicinity of the stream *and it is true that those ditches have ceased to be of much value, the flow in them having largely diminished.*

[5] All italics in this brief are supplied by the author.

"It cannot be denied, in view of all the testimony * * *, that the diminution of the flow of water in the river by the irrigation of Colorado has worked some detriment to the southwestern part of Kansas, and yet, when we compare the amount of this detriment with the great benefit which has obviously resulted to the counties in Colorado, it would seem that equality of right and equity between the two states forbids any interference with the present withdrawal of water in Colorado for purposes of irrigation."

The Court thus summarized its conclusions (206 U. S. 117):

"Summing up our conclusions, we are of the opinion that the contention of Colorado of two streams cannot be sustained; that the appropriation of the waters of the Arkansas by Colorado, for purposes of irrigation, has diminished the flow of water into the state of Kansas; that the result of that appropriation has been the reclamation of large areas in Colorado, transforming thousands of acres into fertile fields and rendering possible their occupation and cultivation when otherwise they would have continued barren and unoccupied; *that while the influence of such diminution has been of perceptible injury to portions of the Arkansas valley in Kansas, particularly those portions closest to the Colorado line, yet, to the great body of the valley it has worked little, if any, detriment, and regarding the interests of both states, and the right of each to receive benefit through irrigation and in any other manner from the waters of this stream, we are not satisfied that Kansas has made out a case entitling it to a decree.* At the same time it is obvious that if the depletion of the waters of the river by Colorado continues to increase there will come a time when Kansas may justly say that there is no longer an equitable division of benefits and may rightfully call for relief against the action of Colorado, its corpora-

tions and citizens in appropriating the waters of the Arkansas for irrigation purposes."

The following direction was made with reference to the entry of a decree (206 U. S. 117):

> "The decree which, therefore, will be entered, will be one dismissing the petition of the intervener, without prejudice to the rights of the United States to take such action as it shall deem necessary to preserve or improve the navigability of the Arkansas river. The decree will also dismiss the bill of the state of Kansas as against all defendants, without prejudice to the right of the plaintiff to institute new proceedings *whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river.*"

4. The Interstate Controversy Since the 1907 Decision in Kansas v. Colorado.

It will be remembered that in its decision in *Kansas v. Colorado* this Court stated that the irrigating ditches in the western counties of Kansas "have ceased to be of much value, the flow in them having largely diminished" (206 U. S. 113). This holding conformed to the allegation by Kansas in its bill of complaint that "the water for the irrigation ditches in the western part of Kansas has been entirely cut off" (206 U. S. 52).

Since the basis of the Kansas demand in this cause is the need for Arkansas river water to irrigate land in western Kansas, and since by its 1907 decision the Court left the door open for Kansas to sue for relief when a material increase in the depletion of the basin water supply by Colorado should result in injury to the substantial interests in Kansas (206 U. S. 117), it is well to consider

what has transpired since 1907 in connection with the Kansas ditches and their demands against Colorado and its water users.

(a) Kansas Rotation Agreement.

On August 30, 1908, The Finney County Water Users' Association, one of the defendants herein and the owner of the Farmers ditch, brought in the district court of Kearney county, Kansas, a suit, which later was removed to the United States Circuit Court, for an adjudication, on a priority basis, of all ditches diverting from the Arkansas river in Kansas (Tr. pp. 3530-3539). This intrastate controversy was settled by a stipulation dated May 16, 1911, under which the divertible waters of the Arkansas river were to be divided between, and rotated among, the ditches in Kearney and Finney counties in certain stated proportions until the determination of a suit brought by The United States Irrigating Company against certain Colorado water users in the United States Circuit Court for Colorado. Thereafter, the divertible waters of the Arkansas river, including the supplies expected to be acquired from the Colorado ditches, were to be divided, distributed and rotated in the following proportions and amounts (Tr. p. 3534): to the Garden City ditch 2/21st, 1,500 acre-feet; to the Farmers ditch 5/21st, 3,750 acre-feet; to the Great Eastern ditch 6/21st, 4,500 acre-feet; to the South Side ditch 4/21st, 3,000 acre-feet; and to the Amazon ditch 4/21st, 3,000 acre-feet (App. A, pp. 134-135). Under the stipulation and decree a distributing officer or water bailiff was appointed by the court to distribute the stream flows among the five ditches in the stated proportions. This officer was later replaced by an agency of the state.

(b) The 1916 Settlement.

On August 27, 1910, The United States Irrigating Company, owner of the Great Eastern, Garden City, and Amazon ditches brought suit in the United States Circuit

Court for Colorado against certain Colorado water users to procure a decree establishing its claimed legal title by priority date and amount, regardless of state lines, as against the priorities and rights of the defendant Colorado appropriators awarded to them by the courts of the State of Colorado. In this proceeding The Finney County Water Users' Association sought unsuccessfully to intervene (Colo. Ex. 149, Tr. p. 3518). After the presentation of complainant's testimony, and prior to the introduction of evidence on behalf of the defendant Colorado water users, this case was settled by a contract dated February 19, 1916 (Colo. Ex. 148, Tr. p. 3517, App. A, pp. 135-136).

Under the terms of this settlement contract, the Colorado defendants agreed:

(1) To recognize priorities as of date August 27, 1910 in the following Kansas ditches: The Amazon, the South Side, the Great Eastern and the Garden City.[6]

(2) Not to apply for or claim priorities for storage purposes on the Purgatoire river, or on the Arkansas river below the mouth of the Purgatoire river, of a date earlier than August 27, 1910;

(3) To pay the costs of the suit;

(4) To pay the signatory Kansas interests fifty cents per acre then being irrigated by the Colorado defendants and the further sum of $30,000.00.

The Kansas ditches agreed to accept the priority date as of August 27, 1910, and the quantities of water specified in the contract, as a definition and determination of their relative rights as against the rights of appropriators in Colorado taking water from the Arkansas river and its tributaries.

The Colorado defendants made the required payments

[6] These are all the irrigation enterprises in Kearney and Finney counties, Kansas, except the Farmers ditch of The Finney County Water Users' Association which declined to be a party to the contract.

and otherwise complied with the terms of the settlement contract (Tr. p. 3517).

(c) The Suits Brought by The Finney County Water Users' Association.

The Finney County Water Users' Association declined to be a party to the 1916 settlement and in November of that year brought suit in the United States District Court against the same Colorado defendants and for the same purposes as the suit of The United States Irrigating Company. Several years later a similar action was brought against other Colorado water users (Colo. Exs. 2 and 3, Tr. pp. 9-11). Both suits, herein referred to as the Finney County cases, sought to establish on the Arkansas river a system of interstate administration based on individual priorities regardless of state lines.

The case now before this Court seeks to enjoin the further prosecution of these two Finney County cases.

5. The Pleadings in the Case at Bar.

(a) The Complaint.

The complaint in Paragraphs Third and Fourth describes the valley of the Arkansas river in both states. In Paragraphs Fifth, Sixth and Seventh are set forth the principles, legal and administrative, adopted by Colorado to govern the control and utilization of the waters in the state. Then follows, Paragraphs Eighth and Ninth, an outline of the issues raised in the case of *Kansas v. Colorado* and a summation of the decision of this Court rendered May 13, 1907.

Paragraph Tenth contains a statement of the position of Colorado with reference to the dependence of its citizens living in the Arkansas valley upon the waters of the river and the reliance which was placed upon the determination of this Court in the *Kansas v. Colorado* case that Colorado was not then using more than its equitable share of the waters of the river and that Kansas was given

the right to reopen the controversy only when by a material increase of the depletion of the waters of the river there was an injury to the substantial interests of Kansas. The allegation is made that in reliance upon this decision enormous sums of money were spent upon the improvement of the irrigation systems dependent upon the water supply of the Arkansas river system. Then follows a statement as to the acts of the Kansas water users in continuing to file suits against the Colorado waters users, notwithstanding, and in defiance of, the decision of this Court in *Kansas v. Colorado.*

Paragraph Fourteenth avers the effect upon Colorado and its water users of a determination favorable to the plaintiff in the Finney County cases pending in the federal court. It is alleged that the establishment of an interstate priority schedule would utterly disrupt and destroy water administration in the Arkansas basin in Colorado by upsetting the relationship between Colorado priorities determined under Colorado law by requiring the establishment of separate administrative officers to enforce any decree with the result that there would be conflicts of authority with state officers. It is stated that any attempt to enforce individual recognition of a selected appropriator in Kansas, such as The Finney County Water Users' Association, as against a few selected appropriators in Colorado[1] would be destructive of public order, and would be utterly impossible of intelligent administration or obedience and would produce great waste and destruction of the water resources of the basin.

In Paragraph Seventeenth it is alleged, among other things, that:

"Notwithstanding the solemn determination therein entered into (*Kansas v. Colorado*), citizens of the State of Kansas, by their action have placed the State of Kansas in the position of acquiescing in private

[1]Not all Colorado appropriators are named as defendants in the two Finney County cases.

litigation in which it has nothing to lose and everything to gain, the result whereof might be to set aside the effects of the said determination between the states of Kansas and Colorado and thereby to place Kansas in the position of gaining by guerrilla warfare what it is forbidden to assert openly and officially and as a sovereign, and to enable its citizens, by a favorable decision in the lower Federal courts, to lay a perpetual servitude on the territory of the State of Colorado to be thereafter maintained and perpetuated without the consent of Colorado, without consideration of her dignity as a sovereign state, in total disregard of her domestic policy and system of administration, and in defiance of the solemn adjudication made in the case of Kansas against Colorado in 1907."

The Eighteenth Paragraph sets forth the annoyance, harassment and expense caused the Colorado water users by the Finney County cases and states that since no appeal lies as of right to the Supreme Court of the United States, the sovereignty of Colorado with respect to the waters of the Arkansas basin is threatened with adjudication in the lower federal courts without recourse, as of right, to the Supreme Court, the only tribunal rightfully empowered to determine the same.

In the Nineteenth Paragraph of the complaint there are set forth several ways in which the continuance of the Finney County cases will affect Colorado, viz: To allow a lower federal court to usurp the functions of the Supreme Court and adjudicate the sovereign rights of a state in violation of the Eleventh Amendment; to impose on Colorado a perpetual servitude without a decision of this Court; to remove the sovereign control of Colorado over diversions of water in the Arkansas basin in Colorado; to repudiate the decision in *Kansas v. Colorado* and deprive Colorado of the peace and security resulting from that decision; to determine relative usufructuary relations between water users in two states having wholly different laws pertaining to water; to impose upon Colorado, as a

necessary means of enforcing a decree, a body of officials which will usurp the functions of the state administrative officers and finally:

> "(o) To confuse and intermingle forever the respective jurisdictions of the State and Federal governments and also of the judicial and executive branches of both governments, and as a result thereof to hamper and perhaps destroy the orderly evolution of agriculture, industry and human population in the Arkansas Valley."

The relief sought by Colorado is that The Finney County Water Users' Association be enjoined from further prosecution of the pending suits against citizens of Colorado; that the State of Kansas and its other citizens be enjoined from litigating or attempting to litigate the relative rights of the two states and their citizens to the waters of the Arkansas river on the same or similar claims; and that the rights of the State of Colorado and its citizens as fixed and determined by the judgment in the case of *Kansas v. Colorado* be protected.

(b) The Answer of the State of Kansas.

The first 21 paragraphs of the Kansas answer consist of admissions and denials. The admissions are largely as to the physical situation of the Arkansas river and the pendency of the Finney County cases referred to in the Colorado complaint. Substantially all other matters in the complaint are denied. The real substance of the Kansas answer is found in Paragraph Twenty-second which is in effect a cross-bill, although it is not so denominated. In this paragraph counsel describe at length the Arkansas river as it flows through Kansas, set forth the climatic, geographic and hydrographic conditions in the basin of the river in Kansas and outline the development of irrigation in Kansas, listing and describing the irrigation enterprises constructed and claimed to have been operated in Kansas. It is averred that from the year 1880 to the

date of the filing of the bill in this case, Colorado and its water users have appropriated and diverted from the river and withheld from Kansas large quantities of water to which Kansas and its citizens were entitled, to the great injury of irrigated agriculture in Kansas; that many of the appropriations of water by Colorado water users were junior in time and inferior in right to the appropriations made by the water users of Kansas; and that Colorado water users have since May 20, 1901, the date of the filing of the complaint in *Kansas v. Colorado*, largely increased their appropriations and diversions and threaten to still further increase them to the great injury of the Kansas water users.

Kansas prays that the Court protect and quiet the rights of the State of Kansas, its citizens and residents, to their appropriations of water from the Arkansas river for irrigation of lands in Kansas and likewise protect and quiet the right of the defendant The Finney County Water Users' Association to the taking or appropriating of water; that the rights of the residents or citizens of Kansas to divert water from the Arkansas river for the purpose of irrigation be decreed in second feet; and that the State of Colorado, its officers, agents and citizens, be perpetually enjoined from diverting any water from the Arkansas river or its tributaries in Colorado until the rights of the citizens of Kansas shall be satisfied.

(c) Answer of The Finney County Water Users' Association.

The defendant The Finney County Water Users' Association filed a separate answer which is very similar to the answer of the State of Kansas. However, it incorporates the additional averment that it was not a party to the suit of *Kansas v. Colorado* and was, therefore, not bound by that decision. It contends that its right of priority for the Farmers ditch was not adjudicated in the previous litigation and further that Kansas is not a riparian state but, under certain statutes specifically re-

ferred to, the doctrine of priority of appropriation is controlling in that state.

The Finney County Water Users' Association also seeks affirmative relief under Paragraph Twenty-second of its answer. It is there alleged that it is the owner of the Farmers' ditch which was constructed in December, 1880 for the purpose of irrigating from 15,000 to 20,000 acres of land and which now is, and has been, capable of irrigating from 8,000 to 10,000 acres; that as of the date of December, 1880, this ditch appropriated 250 second feet of water from the Arkansas river for which it claims a priority of right to the use as of the aforesaid date as against all junior appropriators in Colorado.

The prayer of the Finney County answer is that Colorado and all of its citizens diverting water from the Arkansas river and its tributaries be perpetually enjoined from diverting any water from the Arkansas river in Colorado until its rights to 250 second feet shall be satisfied.

(d) Reply of the State of Colorado.

The reply of Colorado sets out the position of Colorado with relation to the respective claims of, and rights to, the waters of the river in the two states. The reply is divided into four subdivisions.

Subdivision I consists largely of denials of the averments contained in the answers.

Subdivision II is a recital of the history of the case of *Kansas v. Colorado* and an analysis of the judgment rendered by this Court in that case on May 13, 1907. In this portion of the reply it is asserted that the decree rendered in the former case finally adjudicated and determined, adversely to the State of Kansas, all the claims now made by that state and its citizens in the instant case.

Subdivision III consists of a plea that the State of Colorado in its sovereign capacity represents and speaks for all the water users within that state with derivative

rights from that state and that each thereof would be bound by any adjudication or determination of the issues herein involved.

Subdivision IV sets out the position taken by Colorado as to its right to the use of the waters of the river and the various reasons why Kansas and its citizens cannot now be heard to assert the claims contained in the prayers for affirmative relief.

(e) The Issues as Defined by the Pleadings.

The three main issues presented by the pleadings are:

(1) Is Colorado entitled to an injunction against the further prosecution in a lower federal court of the cases brought by a Kansas water user against Colorado water users?

(2) Has Colorado destroyed or threatened to destroy the equitable apportionment of the benefits from the flow of the stream which this Court by its decision in *Kansas v. Colorado* found had not been impaired by Colorado at that time?

(3) If the answer to (2) is in the affirmative, what is an equitable apportionment between the states?

On the first of these issues the Special Master found in favor of Colorado and the defendants have filed no exception to this portion of his Report.

On the second issue the Special Master found in favor of Kansas, and Colorado has excepted to his Report in this regard.

On the third issue the Special Master attempted to make an equitable apportionment, and all parties have excepted to this phase of his Report.

6. The Evidence.

The appendices to this brief are intended to present, from the standpoint of Colorado, a statement of the per-

tinent and controlling testimony and exhibits. Accordingly, no review of the evidence will be made here.

7. The Stipulation of 1933.

It has been pointed out that under the settlement contract of 1916 the Colorado water users agreed to certain limitations on the construction of storage reservoirs on the Arkansas river below the mouth of the Purgatoire river.[8]

In 1933 the construction of Caddoa Dam and Reservoir by the Corps of Engineers of the United States Army was proposed. Colorado took the position that because of the 1916 settlement it could not actively participate in any move for the construction of Caddoa without some further agreement with Kansas. Accordingly, on December 18, 1933 a stipulation was signed by the Governors, the Attorneys General, the Special Counsel and the Engineers of the two states. This document was later introduced in evidence as a joint exhibit, Kans. Ex. 129, Colo. Ex. 179 (Tr. p. 6053, App. A, pp. 138-141, App. B, pp. 30-35). Briefly the parties agreed to use their influence to obtain the construction of the reservoir and provided for the allocation of water as follows (Stipulation, Section Two):

> "That the construction and operation of said dam and reservoir shall not disturb the status quo of the diversion of water for beneficial uses from said Arkansas River by the ditches and canals now constructed and operated in both of the states of Colorado and Kansas. IT IS UNDERSTOOD AND AGREED that in order to maintain the status quo of said diversions as hereinabove referred to there shall be allocated to the State of Kansas for delivery at the State line in the Arkansas River from Colorado into Kansas a quantity of water up to 77,000 acre-feet annually, of which amount 52,000 acre-feet thereof shall be delivered to the State line during the irrigation season from April 1 to October 1 of each year as and when required by

[8] The Purgatoire river is known locally, and sometimes referred to in the record, as the Picketwire river.

the Kansas state water officials, and 25,000 acre-feet thereof to be delivered during the non-irrigating season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for irrigation or storage; and for irrigation of lands in Colorado below said reservoir a quantity of water up to 160,000 acre-feet annually."

Section Three provides for a proration of the supply at times of deficiency.

Section Four allocates surplus water and reads thus:

"After the allocation of water as provided in the next preceding paragraphs, all additional water which may be impounded in said reservoir, excepting, always the amounts of water discharged for flood control purposes, hereinafter referred to, shall constitute surplus and shall be allocated one-half to Colorado and one-half to Kansas, said surplus to be determined April 1, annually, or such other date as may be mutually agreed upon by water officials of the two States, and the amount allocated to each State shall be discharged from said reservoir from time to time on request of the Water Officials of each State respectively for the water allocated to it, but the release of such water on demand shall not be considered as constituting any part of the amounts specified in paragraph 2 herein."

Section Eight provides as follows:

"This Stipulation is without prejudice to the claims of either part hereto in the above entitled case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties hereto to water flowing in the Arkansas River, or stored in said reservoir."

The Master in his Recommended Decree (Paragraph Six, p. 21) says that this stipulation is not binding upon the two states. Without going into a discussion of such matters at this time, it may be said that there is nothing

in the record or in the report of the Master indicating that there has been any change of conditions along the Arkansas river since 1933 which makes inequitable now an allocation which was equitable then.

8. Caddoa Reservoir.

The construction of Caddoa Dam and Reservoir* by the Corps of Engineers of the United States Army was authorized by the Flood Control Act of June 22, 1936 (49 Stat. 570). Appropriation of funds for construction was made in the Flood Control Act of 1938 (52 Stat. 1215). The cost is borne entirely by the United States. The dam is located across the channel of the Arkansas river about 58 miles above the state line. Work was begun in 1940 and has been completed except for the flood release gates which heretofore have not been obtainable because the necessary priorities for steel have been denied to the project during the present war emergency. Plans contemplate a reservoir with a total capacity of 655,000 acre-feet, of which 385,000 acre-feet constitute a conservation pool (Tr. pp. 6576-77). The present available capacity in the absence of the flood release gates is 270,000 acre-feet. Since the closing of the testimony in the case 100,000 acre-feet of the presently available capacity is, under a temporary arrangement of the Corps of Engineers, being used for conservation storage. Maintenance and operation of the flood pool of the reservoir are "under the supervision" of the War Department, Corps of Engineers, United States Army (52 Stat. 1215). Conservation storage must be in conformity with Colorado law and as permitted by the Corps of Engineers.

SPECIFICATION OF POINTS TO BE URGED

The complainant, the State of Colorado, contends:

1. The suits brought by the defendant The Finney County Water Users' Association against Colorado water users in the federal district court for

*The official name of this project is now John Martin Reservoir Project (54 Stat. 505-508).

the District of Colorado should be enjoined because the equitable apportionment of the benefits arising from the flow of the Arkansas river must be and has been determined by this Court in an original interstate suit.

2. The defendants' cross-bill which seeks to obtain a redefinition of the equitable apportionment between the states by a relitigation of the issues presented in the original suit of *Kansas v. Colorado* should be dismissed because Colorado has not by the use of more than its equitable share of the flow of the stream inflicted any injury on the defendants.

3. The issues presented, and determined by this Court, in the case of *Kansas v. Colorado* should not be relitigated in this case.

4. The Report and the Recommended Decree of the Special Master are contrary to the evidence and the law, are ambiguous, uncertain and unworkable, and reflect a lack of understanding of, and superficial treatment of, the issues.

5. The effect of the Master's Report, as interpreted by Kansas, is to award to Kansas more than its equitable share of the benefits arising from the flow of the interstate stream.

6. If any change in the 1907 decree of equitable apportionment is to be made, then the provisions of the stipulation, executed in 1933 by the officials and representatives of the parties and filed in this case, should be given effect.

SUMMARY OF THE ARGUMENT

The argument for Colorado may be summarized thus:

(1) The injunction sought by Colorado against the further prosecution of the Finney County cases should be granted.

(2) There is no showing that through a material increase in the depletion of the waters of the Arkansas by Colo-

rado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of the benefits between the two states resulting from the flow of the river.

(a) To maintain its cross-bill Kansas must sustain the burden of showing (1) that since the decision in *Kansas v. Colorado* there has been a material increase in the depletion of the waters of the river by Colorado and its water users and (2) that this has resulted in injury to the substantial interests of Kansas.

(b) There has been no material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, since the decision in *Kansas v. Colorado.*

(i) The records of Colorado diversions and return flows show conclusively that since 1907 Colorado has not increased materially the depletion of the flow of the stream.

(ii) Since the decision in *Kansas v. Colorado* there has been no diminution in the amount of state line flow divertible and usable for irrigation in Kansas.

(iii) Since the decision in *Kansas v. Colorado* the quantities of water diverted and used by the Kansas irrigation ditches have materially increased.

(c) There has been no injury to the substantial interests of Kansas.

(i) Population.

(ii) Agricultural Production.

(iii) Irrigated Acreage.

(iv) The great body of the valley in Kansas has not been injured.

(d) Since Kansas has not been injured, no affirmative decree should be entered against Colorado under the cross-bill.

(e) The finding of the Special Master as to stream depletion and injury is contrary to the evidence and the law and should not be accepted or followed by the Court.

(3) The report of the Special Master is so ambiguous, inconsistent and confusing that it is impossible to determine how much water is apportioned to each state and how the stream is to be administered to effectuate such an apportionment.

(a) The Master misconceives the problems inherent in an apportionment between states of a fluctuating water supply such as that of the Arkansas river.

(b) The findings of the Master with relation to the water supply are based upon estimates and are of no practical value.

(c) The recommendations of the Master as to measuring stations reflect a misconception of the existing conditions.

(d) The recommendations of the Master as to the proportionate division between states are uncertain.

(e) The recommendations of the Master with relation to flood waters are uncertain and afford no workable plan for the apportionment of such flood waters.

(f) The Master's recommended decree conflicts with his findings of fact and conclusions of law as to the delivery of water and is unworkable and grossly unfair to the State of Colorado.

(4) The apportionment recommended by the Master allocates to Kansas more than its equitable share of the benefits of the flow of the interstate stream.

(a) The nature of equitable apportionment.

(b) The report of the Master shows on its face that the recommended apportionment would result in taking water from established Colorado uses for Kansas lands that are not now irrigated.

(c) The award of water to Kansas for use in possible future development is improper as it constitutes the recognition of an inchoate right.

(d) The award recommended to be made to Kansas is excessive since Kansas is not now making full use of the water which it has.

(e) The recommended apportionment is inequitable since it utterly disregards the 1916 Settlement and the Stipulation of 1933.

(i) The 1916 Settlement.

(ii) The 1933 Stipulation.

(f) The recommended apportionment would require Colorado to forego present uses in order to deliver water to Kansas at the state line.

(i) Under historical conditions substantial deficiencies would have occurred in state line flows if the recommendation of the Master as interpreted by Kansas had been in effect.

(ii) There is no relationship between the so-called index flows and the state line flow.

(g) While Kansas claims additional water from Colorado for irrigation, the Kansas law is such that there is no assurance that additional water can or will be so used.

(5) The existence and effect of Caddoa reservoir on the regimen of the flow of the stream must be recognized.

(a) A description of Caddoa reservoir.

(b) The Master ignores the effect of Caddoa reservoir.

(c) The Stipulation of 1933 affords a basis of using

Caddoa reservoir to preserve the existing uses and to divide equally the potential conservation benefits.

(6) In numerous minor matters the Report of the Master is either incomplete or incorrect and hence should not be accepted.

(a) The provisions of the Recommended Decree that the states each own certain quantities of water are erroneous.

(b) A decree should not require the measurement of Colorado ditch diversions.

(c) The findings of the Master are incomplete in many particulars.

(7) The defendants' Exceptions to the Report and Recommendation of the Special Master amount to an attempt to rewrite the Report and are without support in the evidence and are unfair to Colorado.

(a) The defendants' theory of rewriting the Report and Decree with changes favorable to their interests is wrong in theory and unsupported by the evidence and the law.

(b) The scheme of apportionment contained in the Kansas exceptions is inequitable.

(c) The Kansas theory ignores the question of conveyance losses between the index stations and state line.

(d) Kansas is inconsistent in claiming a percentage of the index flows as they accrue and in also claiming that the water be delivered when required.

(e) The Kansas position with relation to flood water is unfair.

(8) If a decree of apportionment is to be made, it should follow the 1933 Stipulation.

ARGUMENT

I.

THE INJUNCTION SOUGHT BY COLORADO AGAINST THE FURTHER PROSECUTION OF THE FINNEY COUNTY CASES SHOULD BE GRANTED.

The gravamen of the Colorado complaint in this case is that, for the protection against harassment of its water users and for the maintenance and safeguarding of its quasi-sovereign control over the administration of the waters flowing within its borders, the prosecution in the United States District Court for the District of Colorado of the two Finney County cases should be enjoined. In support of this position Colorado says:

(a) The decision of this Court in *Kansas v. Colorado* made an equitable apportionment between the states of the waters of the stream. On this point there can be no doubt. This Court has expressly recognized that such was the effect of its decision. We quote from *Hinderlider v. La Plata River and Cherry Creek Ditch Company*, 304 U. S. 92, 104-105:

> "The extent of the existing equitable right of Colorado and New Mexico in the La Plata River could obviously have been determined by a suit in this Court, *as was done in Kansas v. Colorado, supra, in respect to rights in the Arkansas River and in Wyoming v. Colorado, supra, in respect to the Laramie.*"

(b) The apportionment so made is binding upon the citizens of each state and all water-claimants. (*Hinderlider v. La Plata, supra*, p. 106) since the rights of the state are indissolubly linked with the rights of the appropriators (*Wyoming v. Colorado*, 259 U. S. 419, 468) and the states stand in judgment for all their appropriators (*Nebraska v. Wyoming*, 295 U. S. 40, 43).

It follows that the repeated attempts by Kansas water users to go behind the decision in *Kansas v. Colorado* must fail as they constitute efforts to avoid a decision of this

Court. No citation of authority is necessary on the proposition that one may not do indirectly what he cannot do directly.

Litigation in inferior courts by holders of rights derived from one state against others holding rights from the neighboring state injects an element of confusion and certainly, when the basic rights of the states have been determined by the final arbiter, such litigation is wholly improper. This Court has made an apportionment between Colorado and Kansas (206 U. S. 117).

As said in *Virginia v. West Virginia*, 246 U. S. 565, 591, 38 S. Ct. 400, 402, it is elementary that judicial power essentially involves the right to enforce the results of its exertion. The rule is that a federal district court, once having obtained jurisdiction of a controversy and having rendered a decision in the matter, has complete power to protect the judgment or decree which it has rendered, and may enjoin an action entertained in a state court by a litigant involving the same subject matter when such action may interfere with or nullify the effect of such judicial determination (*Holmes v. Rowe*, 97 F. (2d) 537, CCA 9th Cir.). The same rule should prevail when action in a lower federal court may interfere with or nullify a decision of the United States Supreme Court.

The cases of *Rickey Land and Cattle Company v. Miller and Lux*, 218 U. S. 258, 31 S. Ct. 11, *Bean v. Morris*, 221 U. S. 485, 31 S. Ct. 703 and *Weiland v. Pioneer Irrigation Company*, 259 U. S. 498, 42 S. Ct. 568 are not precedents against the position of Colorado. Each of these cases involved interstate priorities on small streams. In none of them was a state a party. Likewise in none of them had there been any apportionment, either by decision of this Court or by compact, between the states in which the individuals used the water. Individual interstate priorities are unimportant after such an aportionment is made because, then as pointed out in *Hinderlider v. La Plata, supra*, the question is whether or not a particular individual use is within the quantum allotted to the state.

In this phase of the case the Special Master agreed with Colorado. The matter is thus disposed of by Paragraph Seven of the Recommended Decree (Report, p. 22):

> "It is further considered, ordered and decreed that a permanent injunction is granted against the defendant The Finney County Water Users' Association and its officers, agents and representatives, enjoining the further prosecution of the two suits brought by it and now pending in the United States District Court in the State of Colorado, entitled, The Finney County Water User's Association against The Graham Ditch Company and others, and, The Finney County Water Users' Association against the Coler Ditch and Reservoir Company of Colorado and others, as whatever rights it or others in either the States of Colorado and Kansas may have to the use of said waters are indissolubly linked with those of the state in which they may be in the equitable apportionment of said water."

Neither of the defendants has taken any exceptions to this portion of the Recommended Decree or to Conclusion of Law Eight upon which it is based. We submit that Colorado is clearly entitled to the injunction prayed for in its bill of complaint.

2.

THERE IS NO SHOWING THAT THROUGH A MATERIAL INCREASE IN THE DEPLETION OF THE WATERS OF THE ARKANSAS BY COLORADO, ITS CORPORATIONS OR CITIZENS, THE SUBSTANTIAL INTERESTS OF KANSAS ARE BEING INJURED TO THE EXTENT OF DESTROYING THE EQUITABLE APPORTIONMENT OF THE BENEFITS BETWEEN THE TWO STATES RESULTING FROM THE FLOW OF THE RIVER.

(a) To Maintain its Cross-Bill Kansas Must Sustain The Burden of Showing (1) That Since the Decision in Kansas v. Colorado there has been a Material Increase in the Depletion of the Waters of the River by Colorado and its Water Users and (2) That This has Resulted in Injury to the Substantial Interests of Kansas.

By its affirmative defense, which is in effect a cross-bill, Kansas seeks a definition of its share of the waters of the river and an injunction forbidding Colorado uses until the Kansas rights are satisfied. In other words Kansas is taking advantage of the permission given by this Court in deciding *Kansas v. Colorado* for it to institute new proceedings. However, that permission is definitely and specifically qualified. This Court said (206 U. S. 117):

> "The decree will also dismiss the bill of the State of Kansas as against all the defendants, without prejudice to the right of the plaintiff to institute new proceedings whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river."

In the twenty-one years which elapsed between this decision and the institution of the present suit by Colorado, Kansas did not see fit to invoke the jurisdiction of this Court to litigate further its quarrel with Colorado. During this interval it was content to stand by and let its citizens carry on guerrilla warfare against the Colorado water users. When Colorado sought, by the bringing of this case, to end the harassment of this type of border war, then and only then did Kansas assert in this Court that it had been injured by Colorado since the termination of the former suit. Although Colorado here occupies the position of complainant, it is in reality defending its interests against the demands and attacks of aggressive neighbors.

By its 1907 decision this Court held that Colorado was not, by its water uses, exceeding its fair share of the benefits of the flow of the Arkansas. That decision is conclusive and final on the controversy as it then existed and it is conclusive now, unless Kansas makes the showing which the Court said would entitle it to renew the litigation. The burden is on Kansas to make that showing by clear and

convincing evidence (*New York v. New Jersey*, 256 U. S. 296, 309, 41 S. Ct. 492, 496) for this is a controversy between states and the burden and quantum of proof are governed accordingly (*Washington v. Oregon*, 297 U. S. 517, 529, 56 S. Ct. 540, 545). This Court has said that its jurisdiction in respect of controversies between states will not be exerted in the absence of absolute necessity (*Alabama v. Arizona*, 291 U. S. 286, 291, 54 S. Ct. 399, 401). The familiar and oft quoted rule is, as stated in *Missouri v. Illinois*, 200 U. S. 496, 521, 26 S. Ct. 268, 270:

> "Before this Court ought to intervene, the case should be of serious magnitude, clearly and fully proved, and the principle to be applied should be one which the court is prepared deliberately to maintain against all considerations on the other side."

The burden upon Kansas of sustaining its cross-bill is much greater than that imposed upon the complainant in an ordinary suit between private parties (*North Dakota v. Minnesota*, 263 U. S. 365, 374, 44 S. Ct. 138, 139; *Connecticut v. Massachusetts*, 282 U. S. 660, 669, 51 S. Ct. 286).

(b) There has been no Material Increase in the Depletion of the Waters of the Arkansas by Colorado, its Corporations or Citizens, since the Decision in Kansas v. Colorado.

The first condition imposed by the Court in its decision in *Kansas v. Colorado* upon the right of Kansas to institute new proceedings was that there be a material increase in the depletions of the waters of the stream by Colorado, its corporations or citizens. It is the position of Colorado that this condition has not occurred, and that there has been no material increase in the depletion of the waters of the interstate stream in Colorado since the decision in *Kansas v. Colorado*.

(i) The Records of Colorado Diversions and Return Flows show conclusively that since 1907 Colorado has not increased materially the Depletion of the Flow of the Stream.

Depletions are caused by diversions and uses of water, and are measured by the quantities of water which, after being diverted from the river, are not returned thereto but are consumed or otherwise withheld therefrom. Records of diversions and data concerning return flows are necessary from which to calculate, by subtraction, the quantities of water withheld from the river, i. e., depletions of the waters of the stream. Such information is available for the period beginning with 1904 for the river section from near Pueblo to the state line. Along this section are located the major ditches and the larger bodies of irrigated lands in the Arkansas river basin in Colorado. These records concerning diversions, returns and depletions may be summarized, as follows:[10]

Annual Diversions, Returns and Depletions
Arkansas River — Pueblo to State Line

(Period Averages in Acre-Feet)

Period	Diversions	Returns	Depletions
1904-1911	906,000	120,000	786,000
1912-1920	984,000	186,000	798,000
1921-1930	987,000	256,000	731,000
1931-1940	787,000		

It is apparent that, although total diversions increased 81,000 acre-feet per year when the 1904-1911 period is com-

[10]The periods were selected in recognition of the diversion records submitted as Kans. Ex. 7 and 7(a) to 7(s) for the years 1912-1931, which records were assembled from Daily Reports of the State of Colorado (Irrigation Division Engineer—Arkansas Valley Ditch Association). From the same source of information the diversion records were supplemented and completed by Colo. Exs. 91 to 98, for the years 1904-1911; Colo. Ex. 152 for the year 1932; also Colo. Ex. 98 and 98(a) for the years 1904 to 1932; and Colo. Ex. 194 (App. B, pp. 36-41) for the years 1921 to 1940. Aggregate diversions shown in the above table include all ditches below Pueblo, together with the Bessemer, Arkansas Valley Conduit, and miscellaneous ditches above Pueblo, but are exclusive of diversions of ditches in Fremont County, in the Canon City vicinity, which are excluded because records of return flows from such diversions are unavailable. The returns shown above are net river gains due to return seepage between Pueblo and the state line, as testified to by the witness Patterson at Transcript pages 883 to 885, and are in substantial agreement with values of 120,000 for 1910; 186,000 for 1912-1920; and 240,000 for 1921-1930, appearing in Kans. Ex. 32 (App. B, p. 72). Depletions are the differences between diversions and returns. Depletion values for 1931-1940 were not calculated because of the absence of testimony concerning return flow tests during that decade. See App. A, pp.81-85.

pared to the 1921-1930 period there was not an increase but a decline of 55,000 acre-feet in the depletion of the waters of the river in Colorado. This showing, based on records of diversions from and returns to the Arkansas river, has not been, nor can it be, disputed by Kansas.

(ii) Since the Decision in Kansas v. Colorado There has been No Diminution in the Amount of State Line Flow Divertible and Usable for Irrigation in Kansas.

Kansas by its cross-bill, and the Master by his report, deal solely with water for irrigation. Hence the character and amounts of state line flows are the best criteria as to whether or not there has been a material increase in the depletions of stream flow in Colorado. Kansas is not concerned with the use which is made of the waters of the interstate stream within the Colorado borders unless thereby the state line flows used for irrigation have been diminished in amount since the entry of the 1907 decree. Colorado insists that there has been no change in the character and no diminution of the amounts of the state line flows divertible and usable for irrigation in Kansas since the decision in *Kansas v. Colorado*.

There was no stream measuring station in the vicinity of the state line until the establishment by Colorado of such a station a few miles above the state line at Holly in October, 1907. This station has been maintained and operated in cooperation with the U. S. Geological Survey. Between the Holly station and the state line certain flows enter the river. Accordingly to arrive at a correct total flow across the state line it is necessary to add to the amounts measured at the Holly station the inflows from two tributaries, Wild Horse Creek and Cheyenne Creek, and from the Holly drain. The Holly drain, a Colorado enterprise, was constructed in 1923 to drain lands near Holly and delivers about 24,000 acre-feet of water annually (Tr. p. 3243). Though the Master in his report ignores these inflows below Holly, they were taken into account by the engineers

of both states.[11] It is believed that the defendants will not dispute the position taken by Colorado with respect to the inflows below Holly.

To determine whether or not the state line flows have diminished since the former decision a comparison should be made of the state line flows as they existed then and the state line flows as they are today. Turning first to a consideration of the flows at the time of the former decision, we find that this Court made no determination as to the amount of such flows. The absence of stream flow records was perhaps the controlling reason. However, from the former decision a rather definite idea can be obtained of the conditions then prevailing with respect to the state line flows.

In his preliminary statement disclosing the general character of the controversy Justice Brewer quoted abstracts of the pleadings and statements of the respective counsel, among which appeared the following statement by Kansas counsel (206 U. S. 52):

> "* * * by the year 1891 all the natural and normal waters and a large portion of the flood waters of the Arkansas river were so appropriated (by Colorado) and diverted and actually applied to these dry, barren, arid, nonriparian and nonsaturated lands in the State of Colorado, said diversions increasing from year to year, as their means of diversion became more complete and perfect *so the average flow of the river was greatly and permanently diminished and the normal flow of the river, exclusive of floods, was wholly and permanently destroyed* * * * and the water for the irrigation ditches in the western part of Kansas has been entirely cut off."

In its opinion, this Court said, with reference to stream flow in Kansas (206 U. S. 115):

[11] See Kansas Ex. 17 for October, 1907 to December, 1930; Colo. Ex. 192 for January, 1931 to September, 1940 and Colo. Exs. 204, 208, 209, 210, 214 and 215 (App. B, pp. 54-68) for the period 1908 to 1938 inclusive.

"That there is a great variance in the amount of water flowing down the channel at different seasons of the year and in different years is undoubted; that at times *the entire bed of the channel has been in places dry is evident from the testimony.*"

The Court said as to the irrigation ditches in western Kansas that (206 U. S. 113):

"It is true that those ditches have ceased to be of much value, *the flow in them having largely diminished.*"

Thus in the former case Kansas contended that the "normal" flow of the river had been wholly and permanently "destroyed" and the Court found that there was a great variance in flow, that at times the entire bed of the channel was "dry" and that the flow in the Kansas ditches had "largely diminished."

In the case at bar Kansas seeks to create the impression that at the time of the former case there was a substantial flow at the state line. Such contention is necessary to substantiate the claim of a material increase in stream depletion by Colorado. Thus in the former case Kansas fought Colorado on the basis that Colorado had utterly "destroyed" the flow into Kansas. In this case Kansas says that there was a substantial flow at that time which has since been depleted by Colorado. It is a fair comment that the knowledge of the true facts was probably more accurate in the contemporary period than it is forty years later.

A witness for Kansas in this case computed the state line flow for the period 1895 to 1907 by making estimates from stream gaging stations, some of which were over 200 miles away. (App. A, pp. 74-75). His results appear in a tabulation in Kans. Ex. 70 (Tr. p. 1569), which also gives the measured flows for the period 1907 to 1930. The following table is from that exhibit:

Year	Acre Feet (Estimated)	Year	Acre Feet (Recorded)	Year	Acre Feet (Recorded)
1895	580,000	1908	570,000	1918	60,000
1896	150,000	1909	250,000	1919	230,000
1897	460,000	1910	170,000	1920	200,000
1898	270,000	1911	110,000	1921*	960,000*
1899	340,000	1912	220,000	1922	100,000
1900	980,000	1913	120,000	1923**	820,000**
1901	180,000	1914	560,000	1924	300,000
1902	280,000	1915	500,000	1925	260,000
1903	410,000	1916	140,000	1926	110,000
1904	500,000	1917	60,000	1927	460,000
1905	950,000	.....	.....	1928	270,000
1906	260,000	.....	.....	1929	260,000
1907	240,000	.....	.....	1930	220,000

*Pueblo Flood.
**Wettest Year in 42 Years.

The period 1895 to 1930 selected by the Kansas witness began just after the drouth of 1888 to 1894 (Tr. p. 3424, 3485, Colo. Ex. 17, 18), and ends just before the recent drouth of 1931 to 1940. Since major floods during the period are included in the annual totals and since by the period selected the drouths of major intensity and duration that immediately preceded and followed it are excluded, Colorado contends that the period averages are thereby distorted, constitute greater than normal values and do not properly represent the true conditions.[12]

The average for the 6-year period 1895 to 1900 inclusive of the estimated flows appearing in Kans. Ex. 70 is 413,000 acre-feet annually. Yet in 1901 Kansas presented to this Court its complaint against Colorado and there alleged that the normal flow of the river was "wholly and permanently destroyed." We submit that the only reasonable conclusion to be drawn is that the estimated values are entirely too high.

[12]While 1923 was admittedly the "wettest year in 42 years"—meaning that total precipitation over the drainage basin in Colorado was the greatest recorded since Weather Bureau stations were established—nevertheless the Kansas witness estimates that state line flows were greater by 160,000 acre-feet in 1900, by 130,000 in 1905, than were recorded in 1923. Also while the Pueblo flood in 1921 was by far the greatest ever observed or recorded in the Arkansas Valley in Colorado the Kansas witness estimates that equal or greater state line flows occurred in both 1900 and 1905.

The important question here is not whether the floods prior to 1908 were of greater frequency or magnitude than the floods of subsequent years, nor whether there were depletions of the stream flows caused by diversions and uses of water in Colorado prior to the institution of the former suit. Instead the question is whether or not the state line flows divertible and usable for irrigation in Kansas have been changed in character or diminished in amount because of materially increased depletions in Colorado since the 1907 decision in *Kansas v. Colorado*. On this question Kansas has presented no evidence to show that the state line flows divertible and usable in Kansas have diminished in amount. However, Colorado did present evidence showing the recorded state line flows during the period 1908 to 1938, the portions thereof that were divertible by ditches of an aggregate capacity of 2,000 cfs. and the portions of divertible flows that were usable and unusable by irrigation enterprises in Kansas. As summarized by Colo. Exs. 209, 211, 214, 215 (App. B, pp. 61-68), (Tr. pp. 6640-6675), the state line flows for the period 1908 to 1938 were as follows:

Flow of Arkansas River Across the State Line From Colorado into Kansas Period 1908 to 1938

(Values in Acre-Feet)

Year	(Colo. Ex. 209) Totals	Divertible Stateline Flows (Colo. Ex. 211) Annual	Winter (a)	Summer (b)	Summer Flows (Colo. Ex. 214, 215) Unusable	Usable
1908	560,800	154,700	109,800	44,900	5,600	39,300
09	251,400	204,000	62,100	141,900	51,100	90,800
1910	119,400	107,400	41,900	65,500	6,500	59,000
11	107,200	102,000	59,400	42,600	0	42,600
12	222,700	184,400	88,700	95,700	19,800	75,900
13	115,300	105,000	82,100	22,900	0	22,900
14	576,500	315,900	48,700	267,200	174,900	92,300
1915	495,700	345,200	66,000	279,200	168,100	111,100
16	144,300	119,500	74,400	45,100	5,500	39,600
17	59,400	59,400	40,400	19,000	0	19,000
18	58,900	58,900	32,600	26,300	0	26,300
19	225,900	207,400	76,400	131,000	61,400	69,600
1920	199,200	190,800	81,100	109,700	31,900	77,800
21	961,400	368,900	60,400	308,500	238,600	69,900
22	93,700	93,700	57,600	36,100	0	36,100
23	800,800	502,100	188,000	314,100	218,900	95,200
24	292,600	292,600	189,100	103,500	47,500	56,000
1925	254,000	183,000	63,500	119,500	40,000	79,500
26	102,900	102,800	48,000	54,800	4,600	50,200
27	452,900	209,900	49,700	160,200	68,800	91,400
28	264,200	196,600	62,700	133,900	74,300	59,600
29	250,800	175,500	91,000	84,500	16,500	68,000
1930	205,500	193,200	126,200	67,000	5,400	61,600
31	107,200	107,200	69,300	37,900	0	37,900
32	58,300	58,300	28,200	30,100	0	30,100
33	173,000	147,200	26,300	120,900	27,100	93,800
34	54,100	50,300	21,200	29,100	0	29,100
1935	193,200	146,200	17,700	128,500	22,300	106,200
36	345,000	170,100	32,000	138,100	35,900	102,200
37	132,300	90,600	23,400	67,200	7,600	59,600
38	204,500	171,200	29,900	141,300	18,200	123,100
AVGE.	260,700	174,700	66,100	108,600	43,600	65,000

(a) October to March inclusive.
(b) April to September inclusive.

The recorded total state line flows (Colo. Ex. 209, App. B, p. 61) for the years 1908 to 1930 as shown in the above table are substantially the same values as appear in Kans. Ex. 70 which his been previously discussed. The average for the period of 1908 to 1930 of 317,000 acre-feet annually is reduced to an average of 260,700 acre-feet annually for the period 1908 to 1938 because of the inclusion

of the eight drouth years of 1931 to 1938. This factor is important because it indicates that the averages compiled by the Kansas witness, being based on periods of above-normal natural precipitation, are excessive in amount.

On the question of whether since the 1907 decision there has been a material increase in stream depletion in Colorado which has manifested itself in a diminution of state line flows divertible and usable for irrigation in Kansas, a comparison of the conditions existing immediately thereafter with the conditions of a recent period shows:

Average Stateline Flows
(Values in Acre-Feet)

Periods of Years	Total Annual Flows	Divertible Summer Flows	Usable Summer Flows
1908-1913 (a)	229,500	68,900	55,100
1933-1938 (b)	183,700	104,200	85,709

(a) First 6-years after decision in 1907 in *Kansas v. Colorado.*
(b) Last 6-years of 1908-1938, during recent drouth of 1931-1940.

Comparing the data for 1908-to 1913 with that for 1933 to 1938 it appears that, while there was a decline in the average annual total state line flows, such a decline could not have adversely affected or injured the Kansas irrigation interests for the reason that there were substantial increases in the quantities divertible and usable by Kansas ditches during the summer months. These increases were recorded in spite of the drouth conditions prevailing during the years 1933 to 1938 and are attributable to the stream flow regulation afforded by irrigation in Colorado under which summer floods and winter flows are conserved for use in time of need, and to the increasing return flows in Colorado. Kansas may not predicate its complaint against Colorado on alleged depletion of stream flows which Kansas did not use and could not have used and which if they were not used in Colorado would flow out of the irrigated region without being placed to use. The above tables show clearly that the waters which could have been diverted and used by Kansas ditches have not decreased since the 1907 decision but to the contrary have progressively increased since then.

Again we point out that Kansas has offered no evidence concerning the divertible and usable state line flows.

(iii) Since the Decision in Kansas v. Colorado the Quantities of Water Diverted and Used by the Kansas Irrigation Ditches have Materially Increased.

It will be remembered that this Court in its 1907 decision stated (206 U. S. 113) that the irrigation ditches in western Kansas "have ceased to be of much value, the flow in them having largely diminished." As repeatedly pointed out herein, the complaint of Kansas and the Report of the Master are both predicated upon the proposition that Kansas has been deprived of water for irrigation purposes. Kansas has introduced no evidence as to the diversions by, or conditions of, its irrigation ditches at the time of, and prior to, the filing of the former case. While Colorado insists upon the validity of its position that the 1907 decision is binding upon the claims of the states as they then existed, it has, for the information of the Court, introduced considerable evidence as to the conditions of the Kansas ditches from 1880 to the present (Tr. pp. 3462-3513), and has shown that in the period 1894-1901 all the Garden City group of ditches were bankrupt, that receivership operation was unsuccessful, that the irrigated acreage declined to insignificant amounts, and that the farmers refused to contract or pay for water (Tr. pp. 3462-3513, App. A, pp. 108-112).

With respect to diversions made by the Kansas ditches since 1907 Colorado presented tables (Colo. Ex. 213, App. B. p. 65, Tr. p. 6656) showing the quantities of water diverted from the surface flows of the Arkansas river each year and each summer season for the period 1908 to 1938 inclusive by all ditches in Hamilton, Kearney and Finney counties in Kansas.[13] Such uses of water as are made for

[13]Because of the failure of Kansas to keep records these flows are necessarily calculated for the period prior to 1915. For the period 1916-1938 the values are from various records as noted on Colo. Ex. 213. In view of the statement of this Court in its 1907 decision relative to the Kansas ditches (206 U. S. 113) the values for the early period would seem to be most generous.

irrigation purposes in all other counties of Kansas, including all portions of the Arkansas river basin in that state east of Finney county, may be ignored herein for the reason that such other uses are not dependent on water supplies received from Colorado (Tr. p. 3544). The following table summarizes the information contained in Colo. Ex. 213 relative to the Kansas ditch diversions.

Diversions from Arkansas River by Ditches
In Hamilton, Kearney and Finney Counties, Kansas
(Values in Acre-Feet; From Colo. Ex. 213)

Year	Annual	Six-Year Averages	Summer Apr.-Sept.	Six-Year Averages
1908	45,000		30,000	
09	93,000		80,000	
1910	57,000		45,000	
11	56,000		40,000	
12	75,000		65,000	
13	29,000	59,200	20,000	46,700
14	96,000	67,700	85,000	55,800
1915	105,000	69,700	90,000	57,500
16	82,200	73,900	41,400	56,900
17	54,300	73,600	17,100	53,100
18	69,300	72,600	26,900	46,700
19	99,000	84,300	58,500	53,200
1920	111,700	86,900	73,700	51,300
21	71,000	81,200	41,600	43,200
22	56,400	77,000	35,200	42,200
1923	116,600	87,300	93,200	54,800
16-Yr. Avge.	76,000		52,700	
1924	55,700	85,100	46,500	58,100
1925	117,500	88,200	65,000	59,200
26	78,700	82,600	47,300	54,800
27	127,800	92,100	89,400	62,800
28	85,500	97,000	40,500	63,600
29	123,400	98,100	62,000	58,400
1930	116,600	108,200	60,200	60,700
31	61,900	99,000	28,500	54,600
32	54,200	94,900	33,700	52,400
33	110,600	92,000	84,200	51,500
34	46,800	85,600	23,400	48,700
1935	102,100	82,000	85,200	52,500
36	120,200	82,600	84,000	56,500
37	69,900	84,000	55,600	61,000
1938	145,200	99,100	122,700	75,800
15-Yr. Avge.	94,400		61,800	
31-Yr. Avge.	84,900		57,100	

Comparing the first six years of this period with the last six years, we find the following:

	Annual Diversions	Summer Diversions (Apr.-Sept.)
1908-1913 inc.	59,200	46,700
1933-1938 inc.	99,100	75,800

Progressive improvement in stream flow conditions at the state line and in western Kansas during recent decades may be demonstrated by the historical relations between the quantities of water diverted from the Arkansas river by ditches in Kansas and the original water supplies of the interstate stream as indicated at selected index stations. Using the index stations selected by Kansas and the combined flows at said stations shown in Kansas Exhibit 134 (App. B, p. 73), the historical relations, by six-year period averages, are given in the following tables:

Relations Between Index Flows and Kansas Diversions
(Compiled from Kans. Ex. 134 and Colo. Ex. 213)

Six Year Periods	Average Annual Index Flows (Acre-Feet)	(% Avg.)	Average Annual Diversions of Ditches in Kansas (Acre-Feet)	(% Avg.)	(% Index)
1908-13	667,510	99.6	59,200	69.7	8.9
1909-14	741,310	110.7	67,700	79.7	9.1
1910-15	719,100	107.3	69,700	82.1	9.7
1911-16	736,160	109.8	73,900	87.0	10.0
1912-17	734,170	109.5	73,600	86.7	10.0
1913-18	726,750	108.4	72,600	85.5	10.0
1914-19	764,270	114.0	84,300	99.3	11.0
1915-20	736,530	109.9	86,900	102.4	11.8
1916-21	750,220	111.9	81,200	95.6	10.8
1917-22	723,360	107.9	77,000	90.7	10.6
1918-23	783,350	116.9	87,300	102.8	11.1
1919-24	784,820	117.1	85,100	100.2	10.9
1920-25	747,270	111.5	88,200	103.9	11.8
1921-26	726,050	108.3	82,600	97.3	11.4
1922-27	726,560	108.4	92,100	108.5	12.7
1923-28	743,000	110.8	97,000	114.3	13.1
1924-29	687,630	102.6	98,100	115.5	14.3
1925-30	673,460	100.5	108,200	127.4	16.1
1926-31	654,070	97.6	99,000	116.6	15.1
1927-32	638,810	95.3	94,900	111.9	14.9
1928-33	590,550	88.1	92,000	108.5	15.6
1929-34	533,120	79.5	85,600	100.9	16.1
1930-35	503,830	75.2	82,000	96.7	16.3
1931-36	512,760	76.5	82,600	97.4	16.2
1932-37	527,350	78.7	84,000	99.0	16.0
1933-38	540,350	80.6	99,100	116.8	18.3
1908-38	670,380	100.	84,900	100.	12.6

During the 1908-1913 period the Kansas ditches diverted an average of 59,200 acre-feet per year, the equivalent of 8.9 percent of the combined index flows of the period. In the 1925-1930 period the Kansas diversions had increased to an average of 108,200 acre-feet per year, the equivalent of 16.1 percent of the index flows. The recent drouth cycle caused the index flows to decrease materially, but the Kansas ditch diversions maintained at average rates i. e., averaging 99,100 acre-feet per year during 1933 to 1938, the equivalent of 18.3 percent of the index flows at that period. *The progressive increase, from 8.9 percent during 1908 to 1913, to 18.3 percent during 1933 to 1938 in the relations between Kansas diversions and stream flows at index stations, evidences a material improvement in stream flow conditions at the state line and in western Kansas during the historical period since the conclusion in 1907 of the original interstate litigation.*

(c) There Has Been no Injury to the Substantial Interests of Kansas.

The second condition imposed by this Court in its 1907 decision upon the right of Kansas to reopen the interstate litigation was that there must be injury to the substantial interests of Kansas. This is in conformity with the rule oft expressed that this Court will not exert its extraordinary power to control the conduct of one state at the suit of another unless the threatened invasion of rights is of serious magnitude (*Connecticut v. Massachusetts*, 282 U. S. 660, 669, 51 S. Ct. 286). The position of Colorado is that Kansas has shown no such injury. The most that can be said of the Kansas evidence is that it tends to show that there is irrigable land in Kansas which could be irrigated if water was available. *There is no showing that any Kansas enterprise, irrigation, industrial, municipal or otherwise, is in any worse condition now than at the time of the former case as a result of anything whatsoever which Colorado has done with reference to the waters of the Arkansas basin. These undisputed facts are completely ignored by the Master.*

In considering the question of possible injury to Kansas this Court in its former decision gave weight to statistics of population and crop production. Evidence offered by Colorado covers these same subjects and shows conclusively that there has been no injury to the substantial interests of Kansas.

(i) Population.

One factor which evidences the condition of a region is the growth and stability of population. In its decision in *Kansas v. Colorado* this Court gave the statistics for Colorado and Kansas counties crossed by the river (206 U. S. 108, 110). The following table taken from United States census bureau reports gives the figures on population in these same counties for each decade from 1880 to 1940 inclusive:

Population of Counties Along Arkansas River
In Eastern Colorado and in Kansas

(As Reported by U. S. Census Bureau)

	1880*	1890*	1900*	1910	1920	1930	1940
Fremont	4,735	9,156	15,636	18,181	17,883	18,896	19,742
Pueblo	7,617	31,491	34,448	52,223	57,683	66,038	68,870
Otero (1889)	.....	4,192	11,522	20,201	22,623	24,390	23,571
Crowley (1911)	.....	.....	.....	.....	6,383	5,934	5,398
Bent	1,654	1,313	3,049	5,043	9,705	9,134	9,653
Prowers (1889)	.....	1,969	3,766	9,520	13,845	14,762	12,304
Colo. Group	14,006	48,121	68,421	105,168	128,122	139,154	139,538
Hamilton	168	2,027	1,426	3,360	2,586	3,328	2,645
Kearney	159	1,571	1,107	3,206	2,617	3,196	2,525
Finney (1884)	.....	3,350	3,469	6,908	7,674	11,014	10,092
Gray (1887)	.....	2,415	1,264	3,121	4,711	6,211	4,773
Ford	3,122	5,308	5,497	11,393	14,273	20,647	17,254
Western Kans.	3,449	14,671	12,763	27,988	31,861	44,396	37,289
Edwards	2,409	3,600	3,682	7,033	7,057	7,295	6,377
Pawnee	5,396	5,204	5,084	8,859	9,323	10,510	10,300
Barton	10,318	13,172	13,784	17,876	18,422	19,776	25,010
Rice	9,292	11,451	11,745	15,106	14,832	13,800	17,213
Reno	12,826	27,079	29,027	37,853	44,423	47,785	52,165
Sedgwick	18,753	43,626	44,037	73,095	92,234	136,330	143,311
Sumner	20,812	30,271	25,631	30,654	29,213	28,960	26,163
Cowley	21,538	34,478	30,156	31,790	35,155	40,903	38,139
Central Kans.	101,344	171,881	166,146	222,266	250,659	305,359	328,678
Kansas Group	104,793	186,552	178,909	250,254	282,520	349,755	355,967

*Figures for years cited by Court in opinion (*Kansas v. Colorado*—1907).

From the foregoing table it appears that, from 1900 to 1940, the population of the counties along the Arkansas river, considered by groups, substantially doubled in Colorado, trebled in western Kansas and doubled in eastern Kansas. From such official records the conclusions seem justified, that no one county or group of counties has unduly grown in size, that none has prospered at the expense of others, and while the Colorado counties have increased their population during the past forty years, similar or greater increases have been recorded in the Kansas counties (App. A, pp. 99-103).

(ii) Agricultural Production.

An indication of prosperity and welfare of the Kansas section of the basin is the acreage and value of field crops. The following table, compiled from Colo. Ex. 55 (App. B, p. 9, Tr. p. 2932) shows the acres of field crops in counties on the channel of the Arkansas river in central and western Kansas.[14]

Acres of Field Crops in Central and Western Kansas

(From K.S.B.A. Reports: Colo. Exs. 55 and 57)

Years	Eight Counties of Central Kansas on Channel of Ark. R.	Five Counties in WesternKansas on River Channel
1881	1,132,209	3,840
1885	1,210,724	15,394
1888	1,201,035	87,215
1890	996,718	90,027
1895	2,402,951	189,349
1900	2,293,617	159,036
1905	2,501,216	274,123
1910	2,602,906	579,012
1915	2,382,817	570,172
1920	2,845,961	797,995
1925	2,894,807	886,048
1930	2,954,708	1,186,581

The values of field crops in Kansas counties along the river are also significant. The table which follows was compiled from Colo. Ex. 66 (App. B., p. 13) and shows the value of field crops as reported by the Kansas State Board of Agriculture.

[14]The figures are taken from the Kansas State Board of Agriculture Reports.

Value of Field Crops in Central and Western Kansas

(From Colo. Exs. 66 and 67)

Years	Eight Counties of Central Kansas on Channel of Ark. R.	Five Counties of Western Kansas on Channel of Ark. R.
1881	$14,231,430	$ 44,514
1885	10,211,050	205,043
1888	10,473,370	778,180
1890	8,869,650	997,475
1895	8,293,421	720,576
1900	16,850,680	1,257,877
1905	22,568,877	2,319,927
1910	25,463,350	5,752,229
1915	29,747,770	7,654,201
1920	62,247,650	15,985,830
1925	38,603,900	10,338,250
1930	26,542,899	10,050,200

The above tables show no injury to the substantial Kansas interests. Rather, they show that since the former decision of this Court there has been a marked increase in the agricultural production of the Kansas counties crossed by the Arkansas river.

(iii) Irrigated Acreage.

The basis of the Kansas cross-bill is that it and its water users have been deprived of water for irrigation purposes. Consequently, it is important to see what the records show as to irrigated acreage. The following table gives the irrigated acreages in the Arkansas river basin in Colorado and Kansas as reported by the United States Census Bureau:

Irrigated Acreages in Arkansas River Basin in Colorado and Kansas

(As Reported by United States Census Bureau)

Year	Basin in Colorado	Data for State of Kansas: Entire State	Ark. R. Basin (a)	Five Counties (b)	Three Counties (c)
1889	144,858	20,818	17,821	17,552	15,499
1899	281,592	23,620	19,483	18,570	17,924
1902	300,115	28,922			
1909	464,236	37,479	35,357	34,879	34,819
1919	(611,476) (d)	47,312	46,539	41,485	(40,660) (e)
	516,213				52,949
1929	557,933	71,290	68,781	60,897	60,072 (f)
1939	469,168	99,980	94,064	64,104	56,341

(a) Data for Arkansas river basin in Kansas excludes areas in Cimarron River valley, but includes areas in tributaries entering below Garden City, as Pawnee Creek, and includes areas irrigated from ground waters, as Scott County and elsewhere.

(b) Five Counties are Hamilton, Kearney, Finney, Gray and Ford.

(c) Three Counties are Hamilton, Kearney and Finney.

(d) Per Colo. Ex. 206: "Believed too large by reason of inclusion of lands under Carey Act and other projects for which irrigation works were not completed."—Figure below from Kans. Ex. 51, i.e., District Water Commissioner Reports.

(e) Kansas witness Knapp (Tr. p. 2355) contends figure is too low—suggests substitution of figure below, from Kans. Ex. 115.

(f) 46,837 acres irrigated with river water, 13,235 acres served by wells and pumps.

With respect to the acreages irrigated in the Arkansas river basin in Colorado and in the counties of Hamilton, Kearney and Finney in Kansas, development has progressed proportionately in both states, and the relations prevailing forty years ago have not been disturbed. This is indicated by the following summary from the foregoing table:

Interstate Relations per Irrigated Acreages

Census Years	Basin Totals	Colorado Portion Acres	Colorado Portion Percents	Kansas Portion Acres	Kansas Portion Percents
1889	160,357	144,858	90.3	15,499	9.7
1899	299,516	281,592	94.0	17,924	6.0
1902	324,650	300,115	92.4	24,535*	7.6*
1909	499,055	464,236	93.0	34,819	7.0
1919**	569,162	516,213	90.7	52,949	9.3
1929	618,005	557,933	90.3	60,072	9.7
1939	525,569	469,168	89.3	56,341	10.7

*Figure for 1902 covers entire basin in Kansas, and includes areas in Cimarron river valley and areas along main river and tributaries in Kansas east of Finney County.

**Figures for 1919 from sources other than United States Census Bureau.

The State of Kansas had 6.0 percent in 1899 and 7.0 percent in 1909 of the total irrigated acreage in the upper Arkansas river basin. Its share of the total has since increased to 9.7 percent in 1929, and to 10.7 percent in 1939. Manifestly, Colorado's expansion of irrigated acreage, whatever may have been its basis, has not prevented Kansas from making the same or greater proportionate expansion of irrigated acreage in that state (App. A, pp. 89-92).

Indeed the whole question of injury to the substantial interests of Kansas may be simply answered by the fact that in this case Kansas has introduced no evidence to show that since the former decision there has been any decline in population, agricultural production or irrigated acreage in the Kansas counties along the Arkansas river, resulting from any acts of Colorado or its water users.

(iv) The Great Body of the Valley in Kansas has Not Been Injured.

In its 1907 decision this Court in summarizing its conclusions referred to the fact that the Colorado irrigation uses have diminished the flow of the water into the State of Kansas and said among other things (206 U. S. 117):

> "* * while the influence of such diminution has been of perceptible injury to portions of the Arkansas valley in Kansas, particularly those portions closest to the Colorado line, yet, to the great body of the valley it has worked little, if any, detriment, and regarding the interests of both states, and the right of each to receive benefit through irrigation and in any other manner from the waters of this stream, we are not satisfied that Kansas has made out a case entitling it to a decree."

Thus it is apparent that in determining the previous suit the Court did not confine its consideration to the few

counties in western Kansas where irrigation is practiced from the surface flows of the Arkansas river in Kansas. Colorado is fully in accord with this treatment of the problem. During the introduction of testimony Kansas has repeatedly and consistently objected to all evidence pertaining to any portions of the basin in Kansas except the few western counties in which irrigation is practiced from the surface flows of the river.

For this discussion it is convenient to divide the drainage basin of the Arkansas river in Kansas at Garden City and to consider the two sections separately. The upper section involves a river length of about 75 miles and a drainage area of 5,265 square miles (Colo. Ex. 205), while the lower section from Garden City to the Oklahoma state line involves a river length of 315 miles and a drainage area of 16,930 square miles (Tr. p. 5755).[15]

The division of the Arkansas river basin in Kansas at Garden City is proper for the reason that all diversions of the surface waters of the main river in Kansas for irrigation purposes are located upstream from Garden City and none are made or attempted below that point. There is no dependence by the portion of the basin below Garden City on water supplies received from Colorado. In that section the water supplies produced by local rainfall not only satisfy all present requirements of water but they produce a surplus outflow that crosses the state line from Kansas into Oklahoma (Tr. p. 5759, App. A, pp. 56, 57).

This unconsumed surplus outflow averaged about 1,700,000 acre-feet per year as recorded during 1922-1931 (Tr. p. 5759) and as indicated in the following table:

[15]This drainage area given for the lower river is exclusive of lands along the southern border of Kansas drained by the Cimarron river, a tributary entering the Arkansas river in Oklahoma, and is exclusive of lands in eastern Kansas drained by the Verdigris and Neosho-Grand rivers, which are also tributary to the Arkansas river in Oklahoma and which deliver across the Oklahoma state line an average of about 4,000,000 acre-feet of water annually in addition to the quantities delivered by the Arkansas river itself.

Flow of Arkansas River	Annual Values in Acre-Feet Recorded Period Averages
At Kans.-Okla. State Line	1,703,414 (a)
At Garden City, Kansas	191,182 (b)
Net Increase (c)	1,512,232

(a) Period 1922-1931 (Tr. p. 5759).
(b) Period 1923-1932 (Tr. p. 5779).
(c) Represents unconsumed surplus of water supply and river flow produced by natural precipitation on the lower Arkansas River basin in Kansas.

The total water supplies of the lower Arkansas river basin in Kansas, produced by natural precipitation on the drainage area between Garden City and the Oklahoma state line, necessarily exceed the total flow of the river, as above outlined, by the quantities of water consumed incident to the production of agricultural crops upon the lands of the tributary drainage area, and by the quantities consumed through the utilization of surface waters for irrigation (as in Pawnee Creek valley), and of ground waters for irrigation and other purposes (Tr. p. 5761). Factual data concerning the growth and development of the counties in central Kansas located along the Arkansas river, and of adjoining counties located wholly or in part in the drainage basin of the Arkansas river, with statistics by years for the period from 1884 to 1930, concerning populations, acreages and values of field crops harvested, assessed valuations, and related information, appear in Colo. Exs. 43 to 71 inclusive (App. A, pp. 92-99, App. B, pp. 3-18).

As described on cross examination (Tr. pp. 5320-5323) by the Irrigation Commissioner of Kansas, the water supplies of the lower Arkansas Valley in Kansas are produced by local precipitation, some of which percolates through the sandy top-soils and enters a water bearing stratum of coarse sands and gravels. This underground formation acts as a large natural storage reservoir; and the river, which necessarily flows in the lowest part of the valley, acts as a drain to carry off the surplus ground waters.

It will be recalled, in the former *Kansas v. Colorado* case, Kansas alleged that the bottom lands of the great body of the Arkansas Valley in Kansas were dependent for their successful and prosperous cultivation on the waters flowing in the Arkansas river, for saturating and sub-irrigating the bottom lands back to the uplands on either side of the river; that prior to extensive irrigation in Colorado the crops on said bottom lands in Kansas were not only bounteous but practically certain; and that, as a result of depletions in Colorado, the surface of the water beneath the bottom lands was lowered about five feet, and the productiveness and value of the bottom lands were greatly diminished (206 U. S. 51-52).

In the case at bar Kansas admits that, contrary to its allegations in the former *Kansas v. Colorado* case, the bottom land agriculture in the Arkansas Valley in Kansas is dependent, not on river flows, but on ground waters produced by local precipitation, and that the river flows consist of surplus and unused water supplies. Manifestly, under such circumstances, nothing that was done prior to or since the decision in *Kansas v. Colorado*, with respect to depletions of the river flows in upstream areas, could have detrimentally affected or injured the substantial interests of the great body of the lower Arkansas Valley in Kansas.

The showing made by Colorado in regard to the basin of the Arkansas river below Garden City has not been disputed by Kansas.

(d) Since Kansas has not Been Injured, No Affirmative Decree Should Be Entered Against Colorado under the Cross-Bill.

It is well to consider for a moment the nature of an interstate suit such as this. If the entire Arkansas basin were in one state, a suit such as this would never arise even though in such a situation the irrigation development would, in all probability, have taken the same course as it has here. This results from the fact that the first use of

water at a point near the source is essential to the greatest conservation and beneficial use of stream flow (Tr. p. 3391). With the development of return flows, uses become possible farther and farther downstream.

Except for those powers delegated to the federal government, the jurisdiction of each state within its own territory is necessarily exclusive and absolute. It is susceptible of no limitation not imposed by itself. Any restriction upon it deriving validity from an external source would imply a diminution of its quasi-sovereignty to the extent of the restriction, and an increase of quasi-sovereignty to the same extent in that state which could impose such restriction. The rule has been stated that all exceptions to the full and complete power of a nation within its own territory must be traced up to the consent of the nation itself (*Schooner Exchange v. McFadden*, 7 Cranch. 116, 136, 3 L. Ed. 287, 293). Recognizing, of course, the supremacy of the federal government as to the powers delegated to it, the same rule applies to the states of the Union.

If Kansas and Colorado were independent sovereignties, Colorado would not be obligated by any principle of international law to permit any part of the flow to pass to Kansas (21 Opinions Attorney General 274). But the states are only quasi-sovereignties, members of our federal Union, and, by the decisions of this Court, each is entitled only to its equitable share of the benefits of the flow of the stream. Since the states may not make war, the equitable apportionment of these benefits may be accomplished only by a compact made with the approval of Congress or by a decision of the United States Supreme Court. While a state may by compact approved by Congress voluntarily submit to restrictions or limitations on use of water, yet those same restrictions or limitations may not be forcibly imposed by a decree of this Court in the absence of a clear showing of serious and substantial injury. Otherwise, the equality of the states would be destroyed.

Any apportionment between states of the waters of an interstate stream which may be made (and we deny that one should be made in this case) must necessarily impose some restriction or limitation on the upper state in order to be effective. This results from the elementary fact that water flows down hill. The imposition of a condition on a lower state is ineffective to produce any apportionment of stream flow. Whatever limitations or restrictions are placed upon an upper state amount actually to the impairment of the quasi-sovereignty of the upper state. When an apportionment is made by action of this Court, the limitations and restrictions on the upper state are imposed, not voluntarily, but by a greater power, the Court. Because such limitations and restrictions constitute an actual infringement on the quasi-sovereign powers of the state, the Court has always been most reluctant to control the acts and powers of a state and has repeatedly held that it woud not do so unless an injury of serious magnitude is established by clear and convincing evidence (*Connecticut v. Massachusetts*, 282 U. S. 660, 669, 51 S. Ct. 286). Hence the question of whether or not Kansas is entitled to relief against Colorado under its cross-bill resolves itself to a determination of whether or not Kansas has suffered an injury of serious magnitude shown by clear and convincing evidence to have resulted from some act of Colorado. No such injury has been shown.

(e) The Finding of the Special Master As to Stream Depletion and Injury is Contrary to the Evidence and the Law and Should not be accepted or followed By the Court.

In his Report the Special Master refers to the question of stream depletion and injury to Kansas only in his Finding of Fact "Five" (Report p. 9) which reads thus:

> "*Depletion by Colorado of the Water Supply of the Arkansas River Since the Taking of Testimony in The Case of Kansas against Colorado decided in 1907.* There has been since the taking of testimony in

the case of Kansas against Colorado cited in 206 U. S. 46, in 1907, a material increase in the river depletion by Colorado of the water supply of the Arkansas river, which has been consumed and used by Colorado users for irrigation purposes and which has diminished the flow of the water into the State of Kansas and that by reason thereof there have been injuries to the substantial interests in Kansas"

At no other place in the Report is the subject mentioned. No specific findings whatsoever are made. *Nothing is found as to the amount of increase in stream depletion by Colorado and the Report is absolutely silent as to the nature of the injuries to Kansas.* Surely, in a case such as this, which, in our federal Union, is the substitute for war, mere general findings, which as we have shown are utterly at variance with the evidence, cannot suffice to justify or require the impairment of the quasi-sovereign rights and powers of Colorado. We say that a disposition of the important contentions of Colorado that it has not made a material increase in the depletion of the stream and that Kansas has not been injured should not be lightly tossed aside by a sweeping general finding. Such procedure is not in conformity with the spirit of the decisions of this Court in interstate controversies.

It has been well said, *Oklahoma v. Texas,* 265 U. S. 560, 44 S. Ct. 573, that its jurisdiction to hear and determine all interstate controversies is perhaps the most impressive prerogative of the United States Supreme Court and has as its result the effect of eliminating the necessity of diplomacy and perchance a resort to the final arbitrament of war. We say that such prerogative is not properly exercised when a general finding such as that made by the Master is used as the basis for the impairment of the quasi-sovereignty of a state. Colorado is entitled to know wherein it has offended before its rights and powers are impaired.

In *Virginia v. West Virginia,* 220 U. S. 1, 36, 31 S. Ct. 330, 336 this Court said that great states have a temper superior to that of private litigants. It is with full recog-

nition of this superior responsibility that Colorado has asserted and is now asserting that neither the state nor its water users has, since the decision in the former case, materially increased the depletion of the water supply of the Arkansas river to the injury of the substantial interests of Kansas. This contention by Colorado is supported by immutable facts. By his general finding of depletion and injury, a finding which we say is utterly without foundation in the record, the Special Master erred most grievously to the great injury of Colorado.

3.

THE REPORT OF THE SPECIAL MASTER IS SO AMBIGUOUS, INCONSISTENT AND CONFUSING THAT IT IS IMPOSSIBLE TO DETERMINE HOW MUCH WATER IS APPORTIONED TO EACH STATE AND HOW THE STREAM IS TO BE ADMINISTERED TO EFFECTUATE SUCH AN APPORTIONMENT.

(a) The Master Misconceives the Problems Inherent in an Apportionment between States of a Fluctuating Water Supply Such as that of the Arkansas River.

All parties have filed exceptions to the Report and Recommendation of the Special Master. A reading of the Report and the exceptions should suffice to establish conclusively the unworkability of the apportionment recommended by the Master.

It is apparent that the Master has brushed aside the Colorado contention that Kansas has failed to sustain the burden of establishing an injury to its substantial interests as a result of increased stream depletion by Colorado, and has dealt with the situation as if the only question involved was the division of a certain amount of water available at all times and easily susceptible of measurement. Nature has not created such a condition in that portion of the Arkansas river lying in Colorado and western Kansas. The water supply has extreme variations. Colorado Exhibit 209, (Tr. p. 6640, App. B., p. 61), shows that in the period 1908-1938 the annual state line flow varied from a minimum of 54,100 acre-feet to a maximum of 961,400 acre-feet (App. A., p. 118).

The concept of the Master seems to be that the water supply of the Arkansas river and its tributaries on the basis of "average annual dependable and fairly continuous amounts" is 1,110,000 acre-feet; that two index stations, i.e., at Canon City and at the mouth of the Purgatoire, will measure accurately the water supply of the Arkansas river and the flow of the river and its tributaries (Recommended Decree, Par. 4, p. 21); and that Colorado is entitled to 925,000 and Kansas 185,000 of the total "average annual dependable supply."[16]

The Master has apparently misconceived or has not thoroughly understood the character of the stream flow in the Arkansas river. His Findings and Decree seem to be based upon the conception that there is "an average, annual, dependable and fairly continuous" amount of water available for distribution between the two states. The fact is, as is clearly demonstrated by the record, that there is no such thing as a "dependable" water supply in the Arkansas river in Colorado. It is impossible to make a division of water supplies based on averages which are the result of adding together extremely varying amounts and dividing the result by the number of years involved. This method results in a false conclusion as to what is a dependable water supply. To be dependable, the water supply must be one which can be forecast and anticipated with a reasonable degree of certainty. The water supply of the Arkansas river in Colorado is highly fluctuating. For instance the supply at Canon City varies from a minimum of 245,750 acre-feet to a maximum of 661,700 acre-feet. The flow at the mouth of the Purgatoire varies from 22,834 acre-feet in one year to 390,404 acre-feet in another. To attempt to distribute or divide the total water supply of the river upon the basis that there is a fairly continuous annual dependable supply can only lead to confusion and future controversies. Further, the repeated use by the Master of the term "natural flow" is confusing as the term is not defined. There is no true "natural flow" after irrigation development as some of the flow is then

[16] This is in the proportion of 5/6 to Colorado and 1/6 to Kansas.

return flow. Among irrigators "natural flow" is sometimes used to mean the flow under virgin conditions prior to irrigation. Others employ the term as meaning all stream flow except that resulting from storage releases or water importations from other basins. For the Report of the Master to be understandable there should be a definition of these terms.

The Canon City gaging station is located at the Royal Gorge where the river emerges from the mountains. From there to the state line, the distance is about 200 miles. Numerous tributaries, among which are Fountain river, Horse creek, and Big Sandy creek, enter from the north. On the south side of the river, there are, among other tributaries, the St. Charles river, Huerfano river, Apishapa river, and the Purgatoire river. There is irrigation along these tributaries. The Master recommends that a measuring station be maintained upon but one of these, i.e., the Purgatoire. From Canon City to the state line the Arkansas river is a losing river except during floods and the spring period of snow melt.[17] The loss of water from evaporation, transpiration and percolation exceeds the accretions to the stream flow (App. A., pp. 62-63). A witness for Colorado has estimated that the average annual natural conveyance loss from Pueblo to the state line, a distance of about 150 miles, is 126,000 acre-feet annually. (Tr. p. 3682). The characteristic, common to practically all streams of the Great Plains area, of natural conveyance losses exceeding natural accretions is a factor which the Master totally disregards. His concept seems to be that if there is a certain flow at Canon City, a percentage of that must and will arrive at the state line for delivery to Kansas. If the Arkansas river were a tightly closed conduit, carrying a supply of water which could be turned out to Colorado and Kansas in their proportionate amounts, the solution of this case would not be difficult, but such is not the situation. In the summer the hot, arid, sandy river bed absorbs moisture as does a sponge. In this con-

[17] In its former decision this Court recognized the difference between streams of the western plains, such as the Arkansas, and streams of the humid regions of the East, such as the Hudson (206 U. S. 116).

nection it should be noted Colorado introduced evidence that in a condition of nature and before the advent of irrigation the river was at times dry in the summer as far upstream as Rocky Ford or about 100 miles above the Kansas-Colorado state line (Tr. pp. 3361-3374, App. A., p. 129). Irrigation in Colorado has the effect of bringing about a more regular and sustained flow at the state line but any decree which requires Colorado to deliver a fixed percentage of the Canon City flow to the state line, in effect commands Colorado to improve upon nature.

The average flow at Canon City for the period 1908-1938 adjusted for by-passed and imported water[18] is 794 c.f.s. The range is from a maximum of 5,260 second-feet to a minimum of 90 second-feet[19] (App. A, p. 126). In its 1907 decision, this Court, with reference to Colorado priorities and the stream flow at Canon City, said (206 U. S. 106):

> "The amount of water authorized to be taken by the (Colorado) ditches from the river is, as alleged in the bill, 4,200 cubic feet, and from its affluents and tributaries 4,300 cubic feet, * * * The average flow of the river as it comes out of the Royal Gorge at Canon City is, as shown by official measurements for a series of years, 750 cubic feet. So that it appears that the irrigating ditches are authorized to take from the Arkansas River much more water than passes in the channel into the valley."

In other words, at the time of the former decision, the Colorado priorities far exceed in amount the average Canon City flow. The Master now recommends that a portion of such flow be delivered to Kansas.

The Master in his Report recognizes that the flow "is variable from year to year and season to season and day to day, and the main river at any one point may be al-

[18] By-passed water is water diverted above the gaging station and conveyed around it. Imported water is water brought to the stream from another basin which in this case is the basin of the Colorado river.

[19] These figures are obtained from Kansas Exhibit 13 (Tr. p. 1434), and Colorado Exhibit 192 (Tr. p. 6499) and do not represent adjusted flows.

most without water one day and have a flood in it the next day, and the following day have practically its original condition." (Report p. 5.) In spite of this physical situation, which the Master recognizes, he recommends in his proposed decree (Report p. 20), that the deliveries to Kansas shall be "at such times and in such amounts as and when required by water officials by the State of Kansas." The Colorado water officials are neither omnipotent nor omniscient. They cannot deliver on demand a water supply of the variability of that found in the Arkansas basin.

Under the Master's decree deliveries to Kansas must always be in balance with the proportion of the water supply allotted to Kansas. It takes several days for water to flow from Canon City to the state line. Conditions of precipitation and evaporation are such that it is an utter impossibility for Colorado water officials to maintain such balance, and yet the Master fails to recognize this physical situation.

The Master recommends that 925,000 acre-feet annually be awarded and delivered to the State of Colorado. This is a misconception of the problem. Colorado receives water as a result of natural precipitation. If there is to be a decree of apportionment herein, the only equitable basis is to adopt a plan such as that contained in the 1933 stipulation which will be discussed in detail later in this brief. No apportionment is equitable which subjects one state to the hazards resulting from the vagaries of nature and at the same time insures to another state a stable water supply.

Finally, the Master's recommendations ignore entirely the principle of beneficial use. The cardinal principle of western irrigation law is that in the arid and semi-arid regions, a water user, to retain his right, must apply the water to beneficial use. He may not by the assertion of a pure legal right deprive his neighbor of water and then permit it to go to waste. The Master specifically states that the allotment to Kansas includes water "for lands to be irrigated." He makes no finding and no recommendation as to the acreage of such lands. *There is no assur-*

ance that any additional lands in Kansas will ever be irrigated. There is no showing of any existing Kansas development which will bring additional lands under irrigation. In other words a substantial portion of water recommended for allotment to Kansas may never be placed to a beneficial use and instead would pass out of the irrigated section of the Arkansas river basin unused. Surely the Colorado farmers who are now using this water should not be made to pass it on down to Kansas to satisfy an inchoate right possibly existing in that State; yet such is the effect of the recommendation of the Master.

(b) The Findings of the Master with relation to the Water Supply are Based upon Estimates and are of No Practical Value.

By his Finding of Fact "Six" (Report p. 16), the Master states that the average annual natural flow of the river and its tributaries is 1,240,000 acre-feet, and the average annual dependable and fairly continuous water supply and flow is 1,110,000 acre-feet. These figures must have been obtained from the testimony of the Kansas witness, Ralph L. Meeker, who claims to have computed the total water production in two different ways, and because the two answers were in substantial agreement, he contends the results must be correct (Tr. p. 1522, App. A., pp. 76-81). Both methods necessarily involve estimated and assumed values. The fact of agreement in answers does not prove the accuracy of the determinations since both may be too high or too low accordingly as the estimated values are assumed at rates above or below correct amounts (Tr. p. 3644, App. A, pp. 63-65).

The question of the accuracy of these estimates is not of primary importance. *The controlling consideration is that this total water supply is not and cannot be measured.* There are over 20,000 square miles of drainage area in the Arkansas river basin in Colorado. Rain and snow fall over this entire area. Some of the water so precipitated collects in stream channels. Many of these channels never reach the river. The water may be lost through per-

colation, evaporation, or irrigation uses. Surely Colorado is not to be penalized because there are innumerable ranchers on the tributaries who make beneficial use of stream flows that in a state of nature never reached the Arkansas river. Under no theory of equity and justice can Kansas or the Colorado water users along the main stream, require that such uses on tributaries be limited or restricted in any way. By the literal wording of the Master's Decree, all these uses would have to be taken into consideration in arriving at Colorado's share of the water. This is wholly impracticable and unnecessary. *To use the entire basin water supply in Colorado as a basis for determining the interstate rights, is to apply an unsound formula and to arrive at a ridiculous result.* Surely the rights of the two states are not to be determined upon the basis of conflicting estimations and assumptions.

(c) The Recommendations of the Master as to Measuring Stations Reflect a Misconception of the Existing Conditions.

The Master recommends (Recommended Decree, Par. 4, p. 21) that "modern measuring devices at stations to accurately measure the water supply of the Arkansas river and the flow of the river and its tributaries" be established at Canon City, at the mouth of the Purgatoire river, and at the Colorado-Kansas state line. Patently, these stations can only measure the flow in the channel at the point where each is located. They could not, and do not, measure the entire water supply of the river and its tributaries.

There has been a stream measuring station at Canon City since 1888, at a point near the mouth of the Purgatoire since 1906, and at a point near the state line since 1908, (Tr. p. 22). Exhibits were introduced showing the flow at these stations during the period 1908 to 1938. For this period the average annual flow at Canon City adjusted for by-passed and imported water was 573,694 acre-feet (App. A, p. 61), at the mouth of the Purgatoire, 96,416 (Kansas Ex. 134, App. B, p. 61, Tr. p. 7019), and at the

state line, 260,700 acre-feet (Colorado Ex. 209, App. B, p. 61, Tr. p. 6640). The combined flow of the Canon City and Purgatoire stations averaged 670,380 acre-feet for this period and represented 60.39% of 1,110,000 acre-feet which the Master finds to be the average annual dependable water supply of the basin.

The Master makes no provision for any adjustment of the Canon City flow. There is water diverted just above the Canon City station for irrigation purposes and carried around the station so that it cannot be measured at the station. Such water should be added to the flow as measured. There are, above the Canon City station numerous importations, by private Colorado interests, of water to the Arkansas river from the basin of the Colorado river. The largest of these, the Twin Lakes, went into operation in 1935 and is designed to import approximately 50,000 acre-feet of water annually under average climatic conditions (Tr. p. 6567). Colorado Exhibit 194 (App. B, pp. 36-41, Tr. p. 6562), shows that these transmountain diversions into the Arkansas river basin averaged 7,683 acre-feet annually prior to 1930, and 28,596 acre-feet annually in the period 1931 to 1940. Proper regard for the Colorado enterprises constructing and owning these transmountain diversions, requires that the flow at Canon City be adjusted by the deduction of all imported water passing the gage. Otherwise, the measurement would not properly reflect the water supply of the Arkansas basin.

In fairness to Colorado, and to the private enterprises who have spent millions on these transmountain diversion projects, Kansas must not be awarded a proportionate part of any of the imported water flowing past Canon City. To give to Kansas any proportionate part of such flow would be to deprive the Colorado enterprises, owning the right to use such imported water, of their property without due process of law. These Colorado enterprises are not parties to this case. Moreover this case involves only the Arkansas river. There cannot here be made an equit-

able apportionment of water from a stream which does not flow to Kansas.[20]

There are located above Canon City, numerous storage reservoirs owned by Colorado enterprises (Tr: p. 383-385.) In these are stored winter flows and flood waters which otherwise could not be used. The flow at Canon City should be adjusted to take care of the storage and release of water in these reservoirs. Otherwise, the flow of the stream at Canon City is not properly reflected by the gage. Water is released from these reservoirs during times of scarcity in the irrigated plains area. To give Kansas a proportionate amount of the Canon City flow and to include in that flow the release from storage reservoirs is to give Kansas a greater amount of water in times of drouth that it would otherwise be entitled to receive. Likewise, at times when storage is going on in these reservoirs, Kansas will not receive its full proportionate share if adjustments are not made for the stored waters.

None of these conditions involving the measurements at Canon City is given any recognition by the Master. It is believed that Kansas will not deny the existence of this situation and the justice of the Colorado position in regard thereto. Its attorneys and engineers are fully aware of the facts.

The recommendation of the Master with respect to these stream gaging stations reflects a superficial treatment and a complete lack of understanding of the problem

[20] All transmountain diversions bringing water to the Arkansas are from the Colorado river. The use of the water of that stream is governed by the Colorado River Compact (House Document 605, 67th Congress, Fourth Session; Colo. Session Laws 1923, Chap. 189), the Boulder Canyon Project Act (45 Stat. 1057) and the Boulder Canyon Project Adjustment Act (54 Stat. 774). With reference to transmountain diversions the Colorado River Compact has been construed thus by the Solicitor of the Interior Department (Decision M-28389, approved by Secretary of Interior April 4, 1936—see Fed. Recl. Laws Annotated, 1936 ed., p. 399):

> "The Colorado River Compact authorizes diversion of Colorado River water into another watershed if such diverted water is to be used within the boundaries of the States through which the Colorado River system extends and if such use is not in excess of that allowed by the compact. The compact, however, does not authorize the diversion of waters of the Colorado River for use in States not included in either the upper or lower basin."

involved. Physical conditions must be accepted as they are. They should not be ignored.

(d) The Recommendations of the Master as to the Proportionate Division between States are Uncertain.

The Master recommends that average dependable supply of the river, which he finds to be 1,110,000 acre-feet, should be apportioned between the states on the basis that 925,000 acre-feet annually go to Colorado and 185,000 acre-feet annually go to Kansas. This is on a ratio of 5 to 1. We have heretofore shown that the combined flow of the stations at Canon City and the mouth of the Purgatoire river amounted to 670,380 acre-feet annually during the period 1908 to 1938 or 60.39% of the 1,110,000 acre-feet found by the Master to be the average annual dependable water supply.

The report of the Master does not state whether the 5 to 1 ratio applies to these so-called index flows. If it does apply, there is then no reason for the finding as to the 1,110,000 acre-feet figure. If it does not apply, then no percentage is given as to the amount of the index flow which Colorado is required to pass to Kansas. In its exceptions Kansas says that the index flows represent 54% of the water supply of the basin (Exceptions, p. 12). This is based upon the testimony of the witness Meeker who compared what he found to be the total water supply to the combined flows of the index stations for the period 1912 to 1930. The 185,000 acre-feet figure which the Master found to be Kansas' share represents 30.87% of the index flows computed on this basis. If the amount of the combined index flows for the period 1908 to 1938 as shown on Kansas Exhibit 134 (670,380 acre-feet), is compared to 1,110,000 acre-feet found by the Master to be the average annual dependable supply, the percentage is 60.39% and the Kansas share would then be 27.59% of the index flows.

It thus appears that there are three possible interpretations of the Report so far as the requirements of delivery to Kansas are concerned, namely, (1) one-sixth or 16.67% of the combined index flows; (2) 30.87% of the

combined index flows; (3) 27.59% of the combined index flows.

Since the Master made no mention anywhere in his report of the figures mentioned in items 2 and 3 above, it would seem that he must have meant that Kansas was entitled to receive one-sixth or 16.67% of the combined index flows. If his intention had been otherwise, it is reasonable to assume that he would have made some finding in his report of the percentage which he deemed proper. Surely the Master did not intend to leave this important matter for future speculation.

One further difficulty should be mentioned. The Master recommends (Recommended Decree, Par. 2, p. 20) that, of the 185,000 acre-feet allotted annually to Kansas, 150,000 acre-feet should be delivered during the period April 1 to October 1; and 35,000 acre-feet during the period October 1 to April 1. No such division is made for the Colorado share of the river supply. Hence it is impossible to obtain any percentage relationship between the two states on a summer or winter basis. No figure is given for Colorado which can be related to the definite figure for Kansas. In other words, under the Master's recommendation the only relationship which can be established is on an annual basis. If this was not his intention, then he would surely have found and used some definite figures. The patent ambiguity which exists must be clarified if there is to be a workable decree.

(e) The Recommendations of the Master with Relation to Flood Waters are Uncertain and Afford No Workable Plan for the Apportionment of Such Flood Waters.

By his Finding of Fact, paragraphs Second, Third and Tenth, (Report, pp. 4, 6, 11) the Master recognizes the occurrence of flood waters along the Arkansas river. These are dealt with by Paragraph 3 of Recommended Decree which reads thus:

> "It is further considered, ordered and decreed, that the flood waters of the Arkansas River and its

tributaries may be controlled and applied to beneficial use by either of the states of Colorado and Kansas in the respective amounts awarded to them as such flood waters flow in the river and its tributaries in the States."

Nowhere in the Master's Report is there anything to indicate what distinguishes flood waters from what he denominates "annual dependable water supply." In order for the Recommended Decree to be effective some line of demarcation must be established. To illustrate the situation attention is directed to the fact that the Master (Par. 4 of the Recommended Decree) provides for gaging stations at Canon City and the mouth of the Purgatoire "to measure accurately the water supply of the Arkansas river and the flow of the river and its tributaries." Kansas by its exceptions (Exception 3 to Recommended Decree, page 24) advances the idea that all amounts of water passing the state line station in quantities larger than the amounts accruing daily to Kansas by a proportionate division of the index flows should be classed as flood waters. Such a concept is contrary to the commonly accepted idea of flood waters and is grossly unfair to the State of Colorado. It would throw into the category of flood waters water accruing to the stream below the so-called index stations regardless of whether such water resulted from ordinary precipitation in normal and usual quantities or return flow from the Colorado irrigated acreage. A flood has been defined as a body of water covering land not usually innundated. Unless it can be said that any flow of water down the dry and sandy bed of the Arkansas constitutes a flood, the position of Kansas cannot be sustained.

For flood waters to be of any value whatsoever for irrigation they must be conserved by storage reservoirs and released during a time of need. There is only one reservoir along the main channel of the Arkansas river where such conservation is possible. It is the Caddoa Reservoir and Dam constructed by the Corps of Engineers of the United States Army. We shall later discuss the position and effect of Caddoa in this interstate controversy.

(f) The Master's Recommended Decree conflicts with his Findings of Fact and Conclusions of Law as to the Delivery of Water and is Unworkable and Grossly Unfair to the State of Colorado.

Paragraph Two of the Recommended Decree (Report p. 20) states there is awarded to Kansas 185,000 acre-feet of water annually of which 150,000 acre-feet shall be delivered at the state line during the season April 1 to October 1, and 35,000 acre-feet during the season October 1 to April 1 "at such times and in such amounts as and when required by water officials of the State of Kansas." Paragraph Nine of the Findings of Fact (Report p. 11) reads that Kansas is entitled to water in the same amounts stated in Paragraph Two of the Decree, after which this statement follows, "at such times and in such amounts of the 35,000 acre-feet as the same could be delivered for irrigation or storage when required by the water officials of Kansas."

Paragraph Three of the Conclusions of Law states that there should be awarded to Kansas the same amounts of water mentioned in Paragraph Two of the Decree and then reads, "at such times and in such amounts of the 35,000 acre-feet as the same could be delivered for irrigation or storage when required by the water officials of Kansas."

It thus appears that in the Findings of Fact and Conclusions of Law only the 35,000 acre-feet of winter water must be delivered by Colorado when required by the Kansas officials. However, the literal wording of Paragraph Two of the Decree seems to be that the entire 185,000 acre-feet awarded annually to Kansas must be delivered in accordance with the demands of the Kansas officials. Thus there is a patent ambiguity between the Recommended Decree and the Findings of Fact and Conclusions of Law as to whether or not the summer water must be delivered by Colorado in accordance with Kansas' demands.

If the Report and Decree are construed so as to require the delivery by Colorado of the entire annual amount

when required, then the decree conflicts with the findings of the Master as to the extreme variability of the flow. In Paragraph Second of the Findings (Report p. 5) the Master states, "the character of the flow of the river in Colorado is variable from year to year and season to season and day to day, and the main river at any one point may be almost without water one day and have a flood in it the next day and the following day have practically its original condition." In Paragraph Third of the Findings (Report p. 6) the Master says, "The character of the flow of the river in Colorado is widely variable from year to year and season to season, and its general flow divides itself into three groups, or kinds of flow, namely: First, the perennial flow from the high mountains consisting of melting snows in the mountains, varying almost from day to day. Second, the intermittent flow, resulting from intense rainstorms on plains area, and, Third, a more or less constant flow varying slightly from year to year and from month to month due to return seepage from irrigated lands."

A variable flow cannot be delivered when required. Colorado is without power to make the rains fall and the snows melt at such times as will satisfy the whims or the needs of the Kansas irrigators. *Natural phenomena are not susceptible of control by court decree.*

The only facility for any regulation of the flow of the Arkansas river is Caddoa Reservoir. This reservoir was wholly financed by the Federal government. There is no statutory or contractural authority for any regulation of the release gates of this reservoir upon the request of officials or water users of either state.

Under the conditions which existed prior to the advent of irrigation, Kansas did not have a regulated water supply. The flow of the stream occurred only as nature made it occur. The record shows that at many times during the summer season the stream bed was dry in Kansas (Tr. pp. 3361-3374). We say with confidence that it is not an equitable apportionment to require an upper state to provide for a lower state a supply of water of greater

certainty and regularity than occurred under virgin stream flow conditions. Colorado must take the water as it is produced by nature. The Colorado irrigators receive water when it is available for them in the stream, not when required for crop production under ideal conditions. Kansas is entitled to no preferential treatment.

4.

THE APPORTIONMENT RECOMMENDED BY THE MASTER ALLOCATES TO KANSAS MORE THAN ITS EQUITABLE SHARE OF THE BENEFITS OF THE FLOW OF THE INTERSTATE STREAM.

(a) The Nature of Equitable Apportionment.

The principle of equitable apportionment, first stated by this Court in *Kansas v. Colorado*, 206 U. S. 46, 100, 117, was thus elucidated in *Connecticut v. Massachusetts*, 282 U. S. 660, 670:

> "For the decision of suits between states, federal, state and international law are considered and applied by this court as the exigencies of the particular case may require. The determination of the relative rights of contending states in respect to the use of streams flowing through them does not depend upon the same considerations and is not governed by the same rules of law that are applied in such states for the solution of similar questions of private right. • • • And, while the municipal law relating to like questions between individuals is to be taken into account, it is not to be deemed to have controlling weight. As was shown in *Kansas v. Colorado*, 206 U. S. 46, 100, (27 S. Ct. 655, 51 L. Ed. 956), such disputes are to be settled on the basis of equality of right. But this is not to say that there must be an equal division of the waters of an interstate stream among the states through which it flows. It means that the principles of right and equity shall be applied having regard to the 'equal level or plane on which all the states stand,

in point of power and right under our constitutional system' and that, upon a consideration of the pertinent laws of the contending states and all other relevant facts, this court will determine what is an equitable apportionment of the use of such waters."

An apt comment on the rule was made in *New Jersey v. New York*, 283 U. S. 336, 342, 51 S. Ct. 478, from which we quote:

> "Both states have real and substantial interests in the river that must be reconciled as best they may be. The different traditions and practices in different parts of the country may lead to varying results but the effort always is to secure an equitable apportionment without quibbling over formulas.

In the practical application of the rule of equitable apportionment several guiding principles have been indicated by decisions of this Court. Perhaps the most important of these is the principle that existing economic development should be protected and preserved whenever possible. This was a controlling factor in the case of *Washington v. Oregon*, 297 U. S. 517, 523, 56 S. Ct. 545 wherein the Court said:

> "To restrain the diversions * * * would bring distress and even ruin to a long-established settlement of tillers of the soil for no other or better purpose than to vindicate a barren right. This is not the high equity that moves the conscience of the court in giving judgment between states. * * * Far from being that, it is rather 'the *summum jus* of power'. In default of reasons for removal more urgent and compelling, the tillers of the soil will be left where they have settled."

A second principle is that inchoate rights dependent upon possible future development furnish no basis for a decree in an interstate suit. This was established in the case of *Arizona v. California*, 283 U. S. 423, 462, 51 S. Ct. 528. There Arizona sought relief against the threatened

invasion of its alleged rights to prohibit and prevent appropriation under its laws of the unappropriated waters of the Colorado river flowing within its borders. This Court, after holding that the contention could not prevail because it was based upon an assumed potential invasion of Arizona rights, said, (283 U. S. 463-464):

> "There is no occasion for determining now Arizona's rights to interstate or local waters which have not yet been, and which may never be, appropriated."

This Court has repeatedly held that it will not issue declaratory decrees (*Alabama v. Arizona*, 291 U. S. 286, 291, 54 S. Ct. 399, 401; *United States v. West Virginia*, 295 U. S. 463, 474, 55 S. Ct. 798, 793; *Massachusetts v. Missouri*, 308 U. S. 1, 15, 60 S. Ct. 39, 42). A decision which attempts to apportion between states rights of use which have not attached is clearly and unmistakably a declaratory judgment. The apportionment of inchoate rights by court decree would create a multitude of unknown hazards. A court must predicate its decision upon actualities, not upon unpredictable future possibilities. It is apparent that, in spite of the application of the best available knowledge on economic and engineering matters, future development may nevertheless contrarily take a different line than that determined by a court. In other words, as a result of human ingenuity and energy, there may be a development in one state that puts to beneficial use water which by a decree operating *in futuro* has been apportioned to another state. It would seem clear that there should be no decree which would permit water to flow out of the basin unused merely because the court allotted it to a state which could not or would not use it.

A third cardinal principle is that each state is obligated to conserve the common supply of an interstate stream. In *Wyoming v. Colorado* 259 U. S. 419, 484 *et seq.* the Court pointed out that a fairly constant and dependable stream flow materially in excess of the lowest might be obtained by means of reservoirs to conserve and utilize

the flow, and stated that it regarded this view as reasonable. After commenting upon the position of Wyoming that it should not be required to provide storage facilities in order that Colorado might obtain a larger amount from the common supply than would otherwise be possible, the Court said (259 U. S. 484):

> "Both states recognize that conservation within practicable limits is essential, in order that needless waste may be prevented and the largest feasible use may be secured. This comports with the all-pervading spirit of the doctrine of appropriation, and takes appropriate heed of the natural necessities out of which it arose. We think that doctrine lays on each of these states a duty to exercise her right reasonably and in a manner calculated to conserve the common supply."

The burden of reservoir construction should not be placed entirely on one state. Yet, from a practical standpoint this is what has happened along the Arkansas. We have heretofore shown that the total decreed capacities of the approximately 200 reservoirs in Colorado amount to 653,427 acre-feet and that the capacity of the one irrigation reservoir in Kansas, Lake McKinnie, is 25,800 acre-feet. Thus Colorado has provided about 96% and Kansas about 4% of the storage space.

While the principle of equitable apportionment has been criticized because of its indefiniteness, that characteristic is, indeed, desirable. From a factual standpoint all streams are different. A formula which would be equitable for one stream might result in gross inequities when applied to another stream. However, certain general factors may be indicated as bearing upon the question of equitable apportionment.[21] Uses of water made in an

[21] These factors are suggested by Restatement of the Law of Torts, vol. IV, Chap. 41, p. 314 *et seq.* The Restatement applies the rule of "reasonable use" in determining rights between riparian proprietors. That rule is in many respects analogous to the rule of equitable apportionment between states.

upper state do not violate the rule unless the gravity of the harm to the lower state outweighs the utility of the use in the upper state. In determining utility of use consideration should be given to (1) the social value which the law attaches to the primary purpose for which the use is made, (2) the suitability of the use to the watercourse and to the customs and usages existing with respect to it, and (3) the impracticability of preventing the harm. Factors bearing on the gravity of harm are (1) the extent of the harm involved, (2) the social value which the law attaches to the particular type of use which is interfered with, (3) the suitability of such use to the particular watercourse, and (4) the burden on the state harmed of avoiding the harm.

An application of these tests to the situation along the Arkansas river will require that no decree be entered which will restrict or curtail the long-existing irrigation development in Colorado. That development has social value and represents a suitable use of the water flowing through the semi-arid region. Kansas has failed to show any harm except that which the Court held in its 1907 decision was insufficient to require a destruction of the benefits received by Colorado (206 U. S. 109). The Colorado use is not disproportionate, wasteful or unnecessarily harmful—and it is a prior use.

(b) The Report of the Master Shows on Its Face that the Recommended Apportionment would Result in taking Water from Established Colorado Uses for Kansas Lands that are not now Irrigated.

In Finding of Fact "Six" (Report p. 10) the Master states:

> "Both states have appropriated *all* of the natural flow of the Arkansas River and its tributaries."

In Finding of Fact "Nine", entitled "Amount of water Awarded To The State of Kansas" (Report p. 11), the Master states:

"• • • there should be awarded and delivered to the State of Kansas, at the Colorado-Kansas state line, 185,000 acre feet annually of the average annual dependable water supply and flow of the river stream for the irrigation in Kansas of the lands now being irrigated, *and for lands to be irrigated*, and lands irrigated from the waters of the Arkansas River prior to the time the State of Colorado increased her development in irrigation • • •."

There is no finding by the Master of any waste by Colorado in the irrigation practices followed in that state. Kansas does not except to the failure of the Master to make such a finding. The conclusion is thus justified (in fact it is required by the evidence) that Colorado has not been wastefully using water. The Master finds the stream to be over-appropriated. In other words the existing water rights exceed the flow of the stream. Then in his apportionment to Kansas the Master awards water "for lands to be irrigated." When the supply is used by existing rights, none remains for future uses on land not now irrigated. No process of legal legerdemain will get more water into the stream than nature produces.

It is obvious that the principle which requires the protection and preservation of existing economic development whenever possible is violated when water is taken from existing Colorado uses for land not now irrigated in Kansas.

(c) The Award of Water to Kansas for Use in Possible Future Development is Improper as it Constitutes the Recognition of an Inchoate Right.

As we have just pointed out the Master recommends that water be awarded to Kansas "for lands to be irrigated." No finding is made as to the extent of such lands or the amount of water required for their successful irrigation. Kansas in its exception VI (pp. 6-7) requests that the following additional finding be made:

"That the extent of land which could be irrigated in Kansas from ditches and laterals heretofore constructed, amounts to approximately 414,000 acres, the development of which was rendered impossible by Colorado's water diversions."

Colorado asserts that there is no evidence in the record that any such amount of land as mentioned in the Kansas exception has ever been irrigated in the Arkansas basin in that state. Indeed as we have heretofore pointed out the irrefutable evidence is that the Kansas irrigated acreage in the five western counties which are crossed by the Arkansas river was:

Year	Acreage
1889	17,572
1899	18,570
1909	34,879
1919	41,485
1929	60,897
1939	64,104

Thus it is plain that to award Kansas water for irrigation of additional land is to recognize an inchoate right dependent upon possible future development which may never take place. We say that no argument is required upon the proposition that water should not be taken away from existing Colorado uses so that at some indefinite time in the future additional land in Kansas may possibly be irrigated. *The tillers of the soil may well be left where they have settled. There is certainly no equity in removing them from Colorado to Kansas.* The interests of the national welfare surely are opposed to the abandonment of Colorado irrigation enterprises merely so that new development may be made in Kansas.

(d) The Award Recommended to be Made to Kansas is Excessive Since Kansas is not Now Making Full Use of the Water which it has.

Colorado Ex. 212 (App. B, p. 64, Tr. p. 6651) shows that the flow of the Arkansas river at Garden City, the eastern terminus of the area wherein there is irrigation

from the surface flows of the Arkansas, averaged 171,000 acre-feet annually in the period 1908-1938. Because of the failure of Kansas to keep adequate records, the values shown in this Colorado exhibit are calculated for the period 1908-1922, but Kansas has introduced no evidence contesting their accuracy.

The witness Patterson estimated that of this Garden City flow during the 1908-1938 period 85,000 feet of divertible water was unused on an annual average (Tr. pp. 6645-6651; App. A, p. 116). No contradictory evidence was interposed by Kansas.

Kansas has constructed but one storage reservoir, Lake McKinnie, capacity 25,800 acre-feet, for the conservation of water. Sites are available for additional reservoirs (Tr. pp. 3313-3320, App. A, p. 114).

Under the rule of *Wyoming v. Colorado, supra*, Kansas must utilize its local supplies and facilities before calling upon Colorado, the upstream state, for more water. The failure of Kansas so to do makes any award to it of additional water from Colorado an inequitable apportionment of the benefits of the flow of the interstate stream.

(e) The Recommended Apportionment is Inequitable Since it Utterly Disregards the 1916 Settlement and the Stipulation of 1933.

(i) The 1916 Settlement.

The rights of individual water users are important in a case such as this because the right of the state is the total of the rights of all its water users. As has been well said, the rights of the states are "indissolubly linked" with the rights of its water users (*Wyoming v. Colorado*, 259 U. S. 419, 468). The Master so finds in this case (Report p. 22).

We have heretofore pointed out that the Kansas enterprises operating irrigating ditches diverting Arkansas

river water consist of the state line group of three small ditches and the Garden City group of five rather large ditches. So far as the state line group is concerned there is no showing that they are not receiving an adequate supply or that they could use a greater supply of water.

Turning then to the Garden City ditches, we have directed attention to the fact that the law suit started by The United States Irrigating Company against individual water users in the federal court was settled by a stipulation in 1916 to which all the Garden City ditches but one, the Farmers ditch owned by The Finney County Water Users' Association, agreed. By this settlement the Kansas ditches agreed to accept the priority date of August 27, 1910, and the quantities of water specified, as a definition and determination of their relative rights as against the rights of appropriators in Colorado taking water from the Arkansas river and its tributaries (Colo. Ex. 148, Tr. p. 3517). Kansas has not shown that these ditches have been deprived of water by any Colorado diversions having a date junior to August 27, 1910.

In *Wyoming v. Colorado*, 259 U. S. 419, this Court discussed at length the priorities in Colorado and Wyoming along the Laramie river and by such procedure determined the existing uses in the two states which it considered should be protected from loss by reason of the proposed Colorado project which Wyoming sought to enjoin. The weight which the Court there gave to priorities as an important factor in determining the total rights of the states is apparent. Applying the same principle here, the Kansas ditches accepted the 1910 date for their priorities. Under an interstate application of the priority doctrine, those ditches could not require the closing of senior Colorado ditches in order to obtain water.

Colorado does not here argue for interstate priorities. In fact the Colorado position is that interstate priorities do not in and of themselves constitute a true and work-

able basis for equitable apportionment.[22] The 1916 settlement is important here because thereby the signatory Kansas ditches subordinated their development and rights to all Colorado uses with priorities senior to August 27, 1910. Surely the state of Kansas cannot now come to the aid of these Kansas ditches and by the repudiation on their behalf of the 1916 settlement obtain more water for them.

While the owners of the Farmers ditch did not execute the 1916 settlement, they were parties to the Kansas rotation agreement. It will be recalled that all the Garden City ditches, including the Farmers, rotate the available water supply (Tr. p. 3534). Hence, whatever water might be secured by reason of the Farmers ditch use would redound to the benefit of all the ditches in that group. Thus the ditches which signed the 1916 settlement would obtain water in addition to that which would have otherwise been available to them under the 1916 settlement. We say that in this interstate suit Kansas may not use the Farmers ditch merely as an excuse for attempting to get more water for the other ditches which did in 1916 finally settle their dispute with the Colorado water users. Kansas should not be allowed to obtain water to satisfy rights lawfully waived for ample consideration by its constituents whose rights are "indissolubly linked" with its own.

(ii) The 1933 Stipulation.

The nature of the 1933 stipulation and the circumstances surrounding its execution are described elsewhere in this brief. It is sufficient to point out here that in section two thereof the amount of water necessary to maintain the *status quo* of the Kansas diversions is

> "a quantity of water up to 77,000 acre-feet annually of which amount 52,000 acre-feet thereof shall be de-

[22] The question of the establishment of an interstate priority schedule as a means of making an equitable apportionment is one of the chief issues in *Nebraska v. Wyoming*, the interstate case involving the North Platte river now pending in this Court. There Nebraska argues for an interstate priority schedule and Colorado, Wyoming and the United States contend otherwise.

livered to the state line during the irrigation season from April 1 to October 1 of each year as and when required by the Kansas State water officials, and 25,000 acre-feet thereof to be delivered during the non-irrigation season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for irrigation or storage."

In 1933 the responsible Kansas officials and the counsel for the defendants in this case agreed that 77,000 acre-feet of water annually would maintain the *status quo* of the Kansas diversions. There is no evidence in the record to the effect that the situation has changed since 1933.

It is plain that if 77,000 acre-feet will maintain the *status quo*, then the additional water awarded Kansas by the Master (108,000 acre-feet on the annual average) is for future development not now existing. There is no equity in a requirement that Colorado deliver such an amount of water to Kansas for uses which may or may not be made in the future. A decree which imposes such a requirement is most certainly a declaration of future rights, the very existence of which is entirely dependent upon what may happen many years from now.

(f) The Recommended Apportionment Would Require Colorado to Forego Present Uses in Order to Deliver Water to Kansas at the State Line.

We have heretofore presented our argument upon the proposition that the Recommended Decree of the Master is ambiguous, uncertain and unworkable. Nothing presented in this section of the brief constitutes any waiver of that argument.

Kansas, in its exceptions, presents the contention that the intent of the Recommendations of the Master is that the Kansas share of the water resources of the Arkansas river constitutes that per cent of the combined stream flows of the Arkansas river at Canon City and the Purgatoire river at its mouth, as will amount to an average of

185,000 acre-feet annually. If such is the intent of the Recommended Decree, and we deny that it is, then Colorado will have to forego present uses in order to satisfy the obligation to deliver the required amounts at the state line.

(i) Under Historical Conditions Substantial Deficiencies Would Have Occurred in State Line Flows if the Recommendation of the Master as Interpreted by Kansas had been in Effect.

The great fallacy of the recommendation is that it deals with average annual amounts and yet contains no provision for carrying over from year to year credits or debits for over or under deliveries.[23] The use of averages is improper unless there is provision for continuous accounting so that the averages cover periods of sufficient length to embrace all climatic cycles. An example will make our position plain.

The following tables cover the period 1908-1938. The state line flows are taken from Colo. Ex. 204 (App. B, pp. 54-58). The delivery obligations are calculated from Kansas Exhibit 134 (App. B, p. 73) by the application of the percentage relationship between the combined flow at the Canon City and Purgatoire stations (670,380 acre feet) and the finding of the Master as to the "average annual dependable supply (1,110,000 acre feet). The percentage

[23]Engineering water studies must be based upon averages. Since no one can forecast with certainty future climatic conditions, these studies must be predicated upon the assumption that natural phenomena tend to repeat or reoccur and hence an average over one period of substantial length will reoccur over another period of about the same number of years. The longer the period covered the more reliable and useful will be the average computed therefrom. To require an average flow to be delivered each year is to disregard the natural fluctuations from the average. Correct use of averages necessitates either the use of a period covering a number of years, for example, 10 years as in the Colorado River Compact (45 Stat. 1057), or the use of a system of credits and debits as in the Rio Grande Compact (53 Stat. 785). By the latter method the upstream state is credited with deliveries in excess of the required amount and debited with deliveries of less than that amount, but limitations are commonly placed upon the amounts of either debits or credits which may be accrued and the length of time for which they may be held without a balancing of accounts. For a criticism of the use of averages see *Wyoming v. Colorado*, 259 U. S. 419, 480.

so computed is 27.6. The assumption is made, as contended for in the Kansas exceptions, that state line flows in excess of the Kansas percentage of the so-called index flows are not chargeable. The difference between the chargeable state line flows and the annual delivery obligations constitutes a deficiency which, during the period mentioned, would have had to be made up by the curtailment of Colorado uses.

TABLE 1

Stateline Flows and Calculated Delivery Obligations

Period 1908-1938: Units 1000 A.F.

Calendar Years	Stateline Flows (Colo. Ex. 204)			Delivery Obligations		
	Annual	Summer	Winter	Annual	Summer (a)	Winter (b)
1908	560.8	44.9	515.9	132.5	107.4	25.1
1909	251.4	189.4	62.0	236.6	191.8	44.8
1910	119.4	77.5	41.9	178.0	144.3	33.7
1911	107.2	47.8	59.4	205.4	166.5	38.9
1912	227.2	134.0	88.7	210.1	170.4	39.7
1913	115.3	33.1	82.2	142.9	115.9	27.0
1914	576.5	527.8	48.7	255.7	207.3	48.4
1915	495.7	429.7	66.0	198.8	161.2	37.6
1916	144.3	69.9	74.4	206.2	167.2	39.0
1917	59.4	19.0	40.4	202.1	163.9	38.2
1918	58.9	26.3	32.6	197.8	160.4	37.4
1919	225.9	149.5	76.4	205.0	166.2	38.8
1920	199.2	118.1	81.1	209.7	170.2	39.7
1921	961.4	901.0	60.4	221.5	179.6	41.9
1922	93.7	36.1	57.6	161.7	131.1	30.6
1923	800.8	589.1	211.7	301.5	244.5	57.0
1924	292.6	103.5	189.1	200.3	162.4	37.9
1925	254.0	190.5	63.5	142.8	115.8	27.0
1926	102.8	54.8	48.0	174.6	141.6	33.0
1927	452.8	403.1	49.7	222.3	180.2	42.1
1928	264.2	201.5	62.7	189.0	153.2	35.8
1929	250.8	159.8	91.0	209.8	170.1	39.7
1930	205.5	67.1	138.4	176.8	143.4	33.4
1931	107.2	37.9	69.3	110.7	89.8	20.9
1932	58.3	30.1	28.2	149.3	121.1	28.2
1933	172.9	146.6	26.3	142.4	115.5	26.9
1934	54.1	32.9	21.2	93.9	76.1	17.8
1935	193.2	175.5	17.7	161.3	130.8	30.5
1936	345.0	313.0	32.0	191.6	155.4	36.2
1937	132.3	108.9	23.4	134.9	109.4	25.5
1938	204.5	174.6	29.9	170.8	138.5	32.3
Avge.	260.7	180.4	80.3	185.0	150.0	35.0

(a) At ratio to annual of 150:185.

(b) At ratio to annual of 35:185.

TABLE 2

Chargeable and Non-Chargeable Stateline Flows

Period 1908-1938: Units 1000 A.F.

Calendar Years	Non-Chargeable Flows			Chargeable Flows (a)		
	Winter	Summer	Annual	Winter	Summer	Annual
1908	490.8	.....	490.8	25.1	44.9	70.0
1909	17.2	.....	17.2	44.8	189.4	234.2
1910	8.2	.....	8.2	33.7	77.5	111.2
1911	20.5	.....	20.5	38.9	47.8	86.7
1912	49.0	.....	49.0	39.7	134.0	173.7
1913	55.2	.....	55.2	27.0	33.1	60.1
1914	0.3	320.5	320.8	48.4	207.3	255.7
1915	28.4	268.5	296.9	37.6	161.2	198.8
1916	30.9	.....	30.9	39.0	69.9	108.9
1917	2.2	.....	2.2	38.2	19.0	57.2
1918	.....	.....	.....	32.6	26.3	58.9
1919	37.6	.....	37.6	38.8	149.5	188.3
1920	41.2	.....	41.2	39.7	118.1	157.8
1921	18.5	721.4	739.9	41.9	179.6	221.5
1922	27.0	.....	27.0	30.6	36.1	66.7
1923	154.7	344.6	499.3	57.0	244.5	301.5
1924	151.2	.....	151.2	37.9	103.5	141.4
1925	36.5	74.7	111.2	27.0	115.8	142.8
1926	15.0	.....	15.0	33.0	54.8	87.8
1927	7.6	222.9	230.5	42.1	180.2	222.3
1928	26.9	48.3	75.2	35.8	153.2	189.0
1929	51.3	.....	51.3	39.7	159.8	199.5
1930	115.0	.....	115.0	23.4	67.1	90.5
1931	48.4	.....	48.4	20.9	37.9	58.8
1932	.....	.....	.....	28.2	30.1	58.3
1933	.....	31.1	31.1	26.3	115.5	141.8
1934	3.4	.....	3.4	17.8	32.9	50.7
1935	.....	44.7	44.7	19.7	130.8	148.5
1936	.....	157.6	157.6	32.0	155.4	187.4
1937	.....	.....	.....	23.4	108.9	132.3
1938	.....	36.1	36.1	29.9	138.5	168.4
Avge.	46.4	73.3	119.7	33.8	107.2	141.0

(a) Assuming all Stateline Flows, regardless of rates and times of occurrence, are chargeable up to the amounts of the season delivery obligation.

TABLE 3

State Line Flows—Annual Excess and Deficiency

Period 1908-1938: Units 1000 A.F.

	Annual State Line Flows			Annual Delivery Obligation	Deficiency (b)
	Totals	Non-Chargeable	Chargeable (a)		
1908	560.8	490.8	70.0	132.5	62.5
1909	251.4	17.2	234.2	236.6	2.4
1910	119.4	8.2	111.2	178.0	66.8
1911	107.2	20.5	86.7	205.4	118.7
1912	227.2	49.0	173.7	210.1	36.4
1913	115.3	55.2	60.1	142.9	82.8
1914	576.5	320.8	255.7	255.7	.....
1915	495.7	296.9	198.8	198.8	.....
1916	144.3	30.9	108.9	206.2	97.3
1917	59.4	2.2	57.2	202.1	144.9
1918	58.9	.....	58.9	197.8	138.9
1919	225.9	37.6	188.3	205.0	16.7
1920	199.2	41.2	157.8	209.7	51.9
1921	961.4	739.9	221.5	221.5	.....
1922	93.7	27.0	66.7	161.7	95.0
1923	800.8	499.3	301.5	301.5	.....
1924	292.6	151.2	141.4	200.3	58.9
1925	254.0	111.2	142.8	142.8	.....
1926	102.8	15.0	87.8	174.6	86.8
1927	452.8	230.5	222.3	222.3	.....
1928	264.2	75.2	189.0	189.0	.....
1929	250.8	51.3	199.5	209.8	10.3
1930	205.5	115.0	90.5	176.8	86.3
1931	107.2	48.4	58.8	110.7	51.9
1932	58.3	.....	58.3	149.3	91.0
1933	172.9	31.1	141.8	142.4	0.6
1934	54.1	3.4	50.7	93.9	43.2
1935	193.2	44.7	148.5	161.3	12.8
1936	345.0	157.6	187.4	191.6	4.2
1937	132.3	.....	132.3	134.9	2.6
1938	204.5	36.1	168.4	170.8	2.4
Avge.	260.7	119.7	141.0	185.0	44.0

(a) As defined in Table 2.

(b) Quantities called out of Colorado ditches in order to meet the specified delivery obligation.

It appears from the foregoing tables that if, during the 1908-1938 period, Colorado had been required to deliver to the state line 27.6% of the so-called index flows, it would have had to forego some of its existing uses in 24 of the 31 years. The average annual deficiency of the state line flows would have been 44,000 acre-feet and in three of the years the deficiencies would have exceeded

100,000 acre-feet. Of course, if instead of 27.6% the figure of 30.8%, contended for in the Kansas Exceptions, had been used, the deficiencies would have been greater.

Actually, under an example such as that given, the average annual amount of reduction in Colorado diversions would have had to exceed 44,000 acre-feet. If the diversions are reduced, the return flow is also reduced and the diversions would have to be further reduced to make up for the loss of return flow.

Also, it should be noted that the above tables are prepared upon the theory that Kansas is chargeable with all water crossing the state line up to the annual and seasonal percentages used of the so-called index flows. If further restrictions are imposed to satisfy the Kansas contention that the water be delivered as and when required, the deficiencies will be much greater.

(ii) There is No Relationship Between The So-Called Index Flows and The State Line Flow.

The recommendations of the Master and the contention of Kansas as indicated by its exceptions seem to be predicated upon the theory that there is a direct relationship between the so-called index flows and the state line flow. This is not true. The Canon City flows, which are approximately 85% of the index flows, consist largely of mountain run-off from melting snows. The state line flows are largely produced by plains floods. As shown by undisputed testimony, all the mountain run-off, both main river and tributary, has been diverted and used in Colorado by ditches constructed and operated for periods of 50 to 80 years (Tr. pp. 3376-3391). This Court in its 1907 opinion in this controversy (206 U. S. 106) recognized that ditches constructed along the Arkansas river in Colorado in 1890 and prior thereto had aggregate diversion capacities greatly in excess of the stream flows at Canon City. Hence they had appropriated all the Canon City flows plus substantially all of the tributary inflows except at times of major plains floods. Any requirement of de-

livery to Kansas of a percentage of the Canon City flows will necessarily mean that the diversions of Colorado ditches must be decreased.

The need for irrigation and the consumption of water by evaporation, transpiration and percolation, between the index stations proposed and the state line, are not constant from year to year, and they do not vary directly with stream flows and water supplies. Instead they are governed largely by climatic conditions, principally lack of precipitation, and are commonly greatest when water supplies are least.

The following table shows clearly the lack of relation between the so-called index flows and the state line flows. The index flows are from Kans. Ex. 134 (App. B, p. 73) and the state line flows from Colo. Ex. 209 (App. B, p. 61).

Year	Index Flows	State Line Flow	State Line Flow in Percent of Index Flow
1908	479,902	560,800	116.8
1909	857,090	251,400	29.3
1910	644,794	119,400	18.6
1911	744,341	107,200	14.5
1912	761,275	222,700	29.3
1913	517,678	115,300	22.2
1914	926,260	576,500	62.2
1915	720,260	495,700	68.8
1916	747,144	144,300	19.3
1917	732,385	59,400	8.1
1918	716,790	58,900	8.2
1919	742,780	225,900	30.4
1920	759,819	199,200	26.2
1921	802,406	961,400	119.8
1922	586,010	93,700	15.9
1923	1,092,294	800,800	73.3
1924	825,511	292,600	35.4
1925	517,456	254,000	49.0
1926	632,510	102,900	16.2
1927	805,474	452,900	56.2
1928	684,665	264,200	38.6
1929	760,064	250,800	32.9
1930	640,583	205,500	32.0
1931	401,150	107,200	26.7
1932	540,931	58,300	10.7
1933	515,932	173,000	33.5
1934	340,060	54,100	15.9
1935	584,331	193,200	33.0
1936	694,175	345,000	49.7
1937	488,699	132,300	27.0
1938	618,920	204,500	33.0

A mere glance at the above table is sufficient to see that there is no relationship whatsoever between the index flows and the state line flow. In two of the years the state line flows exceeded the index flows and in two other years amounted to less than ten percent thereof. The variation is so extreme that common sense requires recognition of the fact that any apportionment based upon a requirement of Colorado to deliver at the state line a percentage of the index flows runs contrary to natural physical facts.

(g) While Kansas Claims Additional Water From Colorado For Irrigation, The Kansas Law Is Such That There Is No Assurance That Additional Water Can Or Will Be So Used.

As we understand the Kansas position in this case, the basis of its demand is that it is allegedly entitled to water for the irrigation of additional lands. This demand is of questionable validity because of the Kansas law with reference to the use of water for irrigation.

Kansas has a statute (Laws of 1886, ch. 115; R. S. 42-101 *et seq.*) purporting to authorize the acquirement by appropriation of the right to use the water flowing in a stream. However, the Kansas Supreme Court has construed that statute as not applicable to destroy the riparian rights of lands patented before its enactment in 1886. We direct attention to the case of *Frizell v. Bindley*, 144 Kan. 84, 58 P. (2d) 95, wherein certain water users on Pawnee Creek, a tributary of the Arkansas, claimed prior appropriations as against upstream users. The defendants asserted that, since their lands were patented prior to 1886, riparian rights attached and appropriation rights asserted by downstream users were not good as against them. The Kansas Supreme Court held with the defendants, saying (144 Kan. 91):

> "By 1886, however, all the lands of the Pawnee valley of present concern had passed out of the public domain into private ownership under United States land patents or by mesne conveyances from the original patentees. As riparian owners, therefore, their

rights in and to the waters of Pawnee Creek were dependent on whatever was the law of this state at the time their land passed into private ownership. Those rights were such as attached to riparian lands at common law."

(p. 92) "In 1886 there was—and this Court takes judicial cognizance of the fact—a large amount of land in western Kansas which was still a part of the public domain, to which no private rights of proprietorship had attached. We are not now called on to decide whether the statute of 1886 is valid as applied to such lands afterwards patented or not."

Thus the holding of the highest court in Kansas is that on lands patented prior to 1886 riparian rights attach and that it makes no decision as to whether the 1886 statute is valid as to lands patented after 1886.[24]

There is no showing in this case as to what, if any, lands which are or may be irrigated in Kansas were patented prior or subsequent to 1886. Kansas Exception VI seeks to inject a finding of 414,000 acres of irrigable land in Kansas. There is no showing that under Kansas law water could be used for irrigation on this land. If the riparian doctrine applies, it probably cannot be because under that doctrine lands not bordering on the stream have no riparian rights.[25] The conservation and beneficial use of the waters of the Arkansas so as to preserve and protect the public welfare will be ill served if water is taken away from Colorado users who are actually irrigating and growing crops and then, because of the Kansas law, permitted to pass unused out of the irrigated section of the basin.

---

[24] In a later Kansas case, *Smith v. Miller*, 147 Kan. 40, 42, 75 P. (2d) 273 (1938), it was said:

"Under the common law as frequently declared by this Court, water in the natural character of a running channel is an inseparable attribute of the land through which the stream flows. In legal parlance it is part and parcel of the land itself."

[25] See U. S. Department of Agriculture Misc. Pub. No. 418 "Selected Problems in the Law of Water Rights in the West" p. 46.

5.

THE EXISTENCE AND EFFECT OF CADDOA RESERVOIR ON THE REGIMEN OF THE FLOW OF THE STREAM MUST BE RECOGNIZED.

(a) A Description of Caddoa Reservoir.

Construction of Caddoa Dam and appurtenant works by the Corps of Engineers of the War Department was authorized by Congress in the Flood Control Act of June 22, 1936 (49 Stat. 1570). Maintenance and operation of the project after its completion were by the Flood Control Act of 1938 (52 Stat. 1215), placed under the supervision of the War Department, Corps of Engineers, United States Army. There are no provisions for any repayment obligation on the part of local interests benefited by the construction of the project. Work was begun in 1940 and is now practically completed, except for the installation of certain large flood release gates which cannot be obtained until the present war emergency permits the release of the strategic materials needed for them. Plans for Caddoa Reservoir contemplate a capacity of 655,000 acre-feet of which 270,000 acre-feet is reserved for flood control and 385,000 acre-feet is allotted to conservation storage. Because of the inability to install the flood release gates, the present available capacity is approximately 270,000 acre feet.

The Caddoa Dam is located across the channel of the Arkansas river about 58 miles above the state line. Obviously it cannot control or regulate the flow of the river caused by tributaries entering below and draining an area of 6,448 square miles in Colorado (Colo. Ex. 205), nor can it control the return flows from ditches and lands along the river between Caddoa and the state line. The reservoir might operate to cut off the flow of the river at that point except in such years as the flow exceeds the available storage capacity and except for the provision of the 1933 stipulation that the construction and operation of Caddoa shall not disturb the *status quo* of the diversion of water for beneficial uses from the river by the ditches

and canals now constructed and operated in both states. In spite of the conclusions of the Master, and until this Court holds otherwise, Colorado recognizes the stipulation as binding upon it.

Because of anticipated siltation Caddoa reservoir is estimated to have a limited life, the length of which will depend upon the occurrence of floods which wash down large deposits of silt to fill up the reservoir bed. Colorado witness Patterson estimated the effective life of the conservation pool at 60 to 82 years (Tr. p. 6687). The Kansas witness Knapp was inclined to accept the shorter period (Tr. p. 7003). The construction of other flood control dams above Caddoa would retard the deposit of silt and thus lengthen the effective life of Caddoa.

The conservation storage of water in Caddoa will have to be in conformity with Colorado law. The states possess control of the waters within their borders subject to the acknowledged jurisdiction of the United States under the commerce clause of the constitution (*U. S. v. Appalachian Power Co.* 113 U. S. 377, 405; *California-Oregon Power Co. v. Beaver Portland Cement Co.*, 295 U. S. 142, 163-164). No appropriation has been secured under Colorado law for any conservation storage of water in Caddoa. A more detailed description and discussion of Caddoa is found in Appendix A, pages 141-156.

(b) The Master Ignores The Effect of Caddoa Reservoir.

The Master disposes of Caddoa Reservoir by Paragraph Six of his Recommended Decree (Report p. 21) which reads:

> "It is further considered, ordered and decreed that the construction of the incompleted dam and reservoir in the channel of the Arkansas river known as the Caddoa reservoir, and the execution of the purported written stipulation of date December 18, 1933, by the officials, attorneys and engineers of the states of Colorado and Kansas are not binding upon either of the two states in the adjudication of an equitable

apportionment of the water supply of the Arkansas river and its tributaries between the two states."

This conforms with Paragraph Thirteen of the Findings of Fact and Paragraph Seven of the Conclusions of Law. (Report p. 16). The statement that the construction of this dam and reservoir is "not binding" upon either of the states indicates a total disregard of the real problem. The dam is there and it is bound to affect the flow of water. No arguments are required upon the proposition that Caddoa should be used for the best possible conservation and regulation of flows of the Arkansas river. The millions of dolars spent by the United States in its construction must not be casually thrown out the window. We believe that Kansas will not deny the fact that, at the time of the authorization of Caddoa and the appropriation of funds for its construction, the congressional delegations from both states acted under the belief that the construction of this dam and reservoir would afford a means of settling this long standing dispute between Kansas and Colorado.[26] Common sense requires that it be utilized to effectuate this desirable purpose.

(c) The Stipulation of 1933 Affords A Basis of using Caddoa Reservoir to Preserve the Existing Use and to Divide Equally the Potential Conservation Benefits.

Prior to the authorization and construction of Caddoa the officials and counsel for the parties to this case entered into a stipulation with reference to the operation and use of Caddoa reservoir.[27] When the Caddoa project was proposed by the Corps of Engineers, Colorado considered that because of the limitations on reservoir construction on the Arkansas below the mouth of the Purgatoire contained in the provisions of the 1916 settlement, it could

[26] See "Hearings before the Committee on Flood Control, House of Representatives, Seventy-Fifth Congress, Third Session," March 30 to April 19, 1938, pp. 704-706, 733-750.

[27] In this connection it should be noted that the statement of the Master in Paragraph Thirteen of the Findings of Fact (Report p. 13) that this stipulation was effected after the construction of Caddoa Dam is clearly an error.

not assent to the proposal without obtaining the approval of Kansas. In other words Colorado felt morally bound by the contract of 1916 which its water users had made with the Kansas water users. Subsequent negotiations resulted in the stipulation of December 18, 1933. Construction of Caddoa was authorized in 1938 and began in 1940.

The 1933 Stipulation recites (1) that the case is pending in the United States Supreme Court (2) that the construction of the Caddoa Reservoir by the United States is under consideration; (3) that it is the thought of the parties that the reservoir would "enable much of the water that flows in said river past the location of said proposed dam to be stored, regulated and conserved for beneficial use; (4) that the parties "recognize the advantages" to be gained from the reservoir "if assured of the protection not only to all rights which they now have and which are involved in the present controversy, but also to their existing water supply in the event said dam" should be constructed and operated prior to the entry of a decree in the pending case; and (5) that it is desirable to provide for the cooperation of the two states and The Finney County Water Users' Association in securing the construction of the dam.

By the stipulation it was agreed thus (App. B, pp. 30-35).

(1) Section One expressed the promise of the parties to use their influence to obtain the construction of the reservoir and then contained this provision:

> "said parties agree as between themselves to the allocation of the water that might be stored in said reservoir, as hereinafter set forth; it being understood that such allocation shall be subject to the storage and discharge of water stored in such reservoir by the United States of America in order to lessen or avoid damages from floods."

(2) Section Two provided for the allocation of the water and we shall quote it in its entirety:

"That the construction and operation of said dam and reservoir shall not disturb the status quo of the diversion of water for beneficial uses from said Arkansas River by the ditches and canals now constructed and operated in both of the states of Colorado and Kansas. IT IS UNDERSTOOD AND AGREED that in order to maintain the status quo of said diversion as hereinabove referred to there shall be allocated to the State of Kansas for delivery at the State line in the Arkansas River from Colorado into Kansas a quantity of water up to 77,000 acre-feet annually, of which amount 52,000 acre-feet thereof shall be delivered to the State line during the irrigation season from April 1 to October 1 of each year as and when required by the Kansas State water officials, and 25,000 acre-feet thereof to be delivered during the non-irrigating season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for irrigation or storage; and for irrigation of lands in Colorado below said reservoir a quantity of water up to 160,000 acre-feet annually."

(3) Section Three provided that when the river flows below the dam should be insufficient to supply the total amount allocated by Section Two, "then in that event the said waters shall be prorated between Colorado and Kansas in the relation hereinabove in paragraph 2 hereof set forth."

(4) Section Four provides for the allocation of surplus water and we shall quote it in full:

"After the allocation of water as provided in the next preceding paragraphs, all additional water which may be impounded in said reservoir, excepting always the amounts of water discharged for flood control purposes, hereinafter referred to, shall constitute surplus and shall be allocated one-half to Colorado and one-half to Kansas, said surplus to be determined April 1, annually, or such other date as may be mutually agreed upon by water officials of the two

States, and the amount allocated to each State shall be discharged from said reservoir from time to time on request of the Water Officials of each State respectively for the water allocated to it, but the release of such water on demand shall not be considered as constituting any part of the amounts specified in paragraph 2 herein."

(5) Section Five provided that any exchanges of water between Colorado ditches located below and above the reservoir shall be made only out of surplus and shall be charged against Colorado's share of the surplus.

(6) Section Six stated that reservoir flood releases shall not be charged against either state unless such releases coincide with a request by a state.

(7) Section Seven makes the provisions for allocation of water effective "when such dam shall have been constructed and water begun to be stored in said reservoir."

(8) Section Eight provides:

"This Stipulation is without prejudice to the claims of either party hereto in the above entitled case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties hereto to water flowing in the Arkansas river, or stored in said reservoir."

(9) Section Nine gives joint control of the storage and discharge of reservoir waters to the two states.

Colorado says that the stipulation represents a method of allocation of water which all parties thought to be equitable at the time of execution. Certainly it would not have been signed if the parties had not considered it fair and equitable. The attitude of Kansas throughout this prolonged litigation would not indicate that the stipulation was agreed to out of a mere feeling of neighborly love. If the Kansas officials had thought for one moment that the stipulation did not contain a fair and proper allocation of water, they would not have signed it. That is a

certainty. It is also a certainty that there has been no change of conditions along the Arkansas river since 1933 which makes inequitable now an allocation which was equitable then.

Section Eight says specifically that the stipulation shall be subject to the decision of the court in this case. Such provision was both necessary and proper. We apprehend that the parties may not write a decree for the court. Section Eight merely recognizes this fact. True it is that the stipulation has no absolute finality so far as this dispute is concerned. Interstate controversies may be settled only by compact with the approval of Congress or by decision of this court. The stipulation is not a compact and it was never approved by the state legislatures nor ratified by Congress. But the stipulation most certainly constitutes an expression of what the responsible officials of these two states considered to be an equitable allocation of water. As such it must be given great weight.

Public officials are assumed to do their duty and to be prompted by legitimate motives (*Louisiana v. Texas*, 176 U. S. 1, 23, 20 S. Ct. 251, 257). Hence, the governors, attorneys general and engineers of these two states must have acted with the rights and the welfare of their respective states in mind when they entered into this stipulation. Certainly there is no evidence to the contrary.

Colorado introduced evidence to show that the provisions of the Stipulation of 1933 could be put into practical effect so as to maintain the *status quo* and afford to each state an equal division of the conservation benefits made possible by Caddoa Reservoir. For this purpose Colorado introduced through its witness Patterson its so-called Operation Plan F, which is simply a suggested method of administering the river in such a manner as to carry out both the letter and the spirit of the 1933 Stipulation. It is not necessary to go into the details of Plan F.

Colorado witness Patterson who testified as to Operation Plan F presented Colorado Exhibit 226 (App. B, p. 71) to show the comparative conservation benefits which

would accrue to the states under administration in accordance with Plan F for a thirty-one year period comparable to that existing in 1908-1938. It appears in this exhibit that the annual average Kansas benefit would be 39,600 acre-feet, or 52.5% of the total and the average annual Colorado benefit 35,900 acre-feet or 47.5% of the total conservation benefit. The only evidence adduced by Kansas in opposition to Plan F tended to show that in certain months and under certain conditions Colorado would have an advantage (Tr. p. 6981). While this is true it is likewise true that in other months and under other conditions the advantage was to Kansas. When the 31-year period is averaged out, Kansas definitely had the edge.

Colorado presented Plan F to show that Caddoa Reservoir could be operated to maintain the *status quo* and divide evenly the conservation benefits made possible by Caddoa. It is the Colorado idea that Caddoa should be used and not disregarded. Kansas presented no evidence whatsoever which made any suggestion as to what, if anything, should be done with Caddoa.

6.

IN NUMEROUS MINOR MATTERS THE REPORT OF THE MASTER IS EITHER INCOMPLETE OR INCORRECT AND HENCE SHOULD NOT BE ACCEPTED.

(a) The Provisions of the Recommended Decree that the States Each Own Certain Quantities of Water are Erroneous.

The Master in Paragraphs One and Two of the Recommended Decree (Report Pages 19-20) says that each of the respective states "is awarded, granted and decreed the owner and entitled to the use of" specified quantities of water. The concept of ownership of water by a state is wrong as water flowing in a natural stream is not subject to true proprietary ownership.

This question of ownership of the water of a non-navigable stream is of no importance in the case at bar. However, it is one of the fundamental issues in the case

of *Nebraska v. Wyoming*, et al., Original No. 7, 1942 Term, now pending and undisposed of on the docket of this Court. That case involves a dispute between Nebraska, Wyoming, Colorado and the United States over the waters of the North Platte River. The question of ownership is in dispute between the United States on one hand and the three states on the other hand. Each of the states, Colorado included, has asserted that the only rights which exist in water in its natural state are rights of use (*Tyler v. Wilkinson*, 4 Mason 397, 400, 241 Fed. Case No. 14312). It is a fundamental principle of the appropriation doctrine of water law that rights to water flowing in public streams may be acquired only by an actual diversion of water from the stream and an application thereof to a beneficial use, the rights so secured being entitled to recognition in the order of their priority. (*Arizona v. California*, 298 U. S. 558, 565, 56 S. Ct. 848).

In accordance with their theory that the only true ownership in flowing water is one of a right in use, the states contend in that case that the provisions of state constitutions and state statutes dedicating the waters of a stream to the public merely mean that the water is *publici juris*, subject to the plenary control of the states through which it flows.[28] It would seem that there should be no determination in this case on the matter of ownership which would have any persuasive effect upon the ultimate decision in the *Nebraska v. Wyoming* case. From the standpoint of uniformity in western water law the holdings in this regard should be the same in the two cases.

(b) A Decree Should Not Require The Measurement of Colorado Ditch Diversions.

Paragraph One of the Decree (Report p. 19) awards to Colorado 925,000 acre-feet annually. Paragraph Eight (Report p. 22) purports to enjoin Colorado, its officials and representatives "from diverting, taking and using

[28] See 1 *Kinney on Irrigation*, 2nd Ed., 656, 1 *Wiel on Water Rights*, 3rd Ed., 197, *California Oregon Power Company v. Beaver Portland Cement Company*, 295 U. S. 142, 163-164, 55 S. Ct. 725.

any water of the Arkansas river and its tributaries" in excess of the amount awarded to it. These provisions should be so clarified as to remove any basis for contentions that the Colorado diversions be measured at the ditch headgates.

Kansas can only be interested in the amount of water which flows across the state line. The uses to which the water is put in Colorado are of no concern to Kansas so long as the state line flows are properly maintained. If there is to be a decree of equitable apportionment, it should be confined to a determination of the amount of water which Colorado must deliver at the state line. No good purpose can possibly be served by requiring a measurement of the Colorado ditch diversions. That is an internal affair which concerns only Colorado.

The fixing of the share of a state in the amount of headgate diversions is an unsound method of equitable apportionment. Such diversions are in a large part made many miles above the state line. Surely the share of a state should be measured at the state line and not at thousands of points above that line. Moreover to determine the share of an upper state in terms of headgate diversions is to ignore entirely the factor of return flow. It is an undisputed fact that such return flow exists and the weight of the evidence is that the quantities are substantial (App. A, pp. 84-87). The Colorado evidence is that official measurement made during the years 1897 to 1904 disclosed that river gains due to return seepages or return flows amounted to an average of 106,000 acre-feet per year in the section between Pueblo and the state line (Tr. p. 883). These measured river gains represent the net effects of the return flow waters. Actual volumes of return flows reaching the river necessarily exceed the measured effects thereof in considering river gains by whatever channel losses prevail along the section. Such channel conveyance losses in this section of the river average 126,300 acre-feet annually (Tr. p. 3682). Similarly conducted measurements made during the years 1922 to 1925 disclose that river

gains due to return seepage had increased by 150,000 acre-feet annually and were then of a magnitude of 256,000 acre-feet per year (Tr. p. 884). Manifestly these return flows must be recognized and taken into consideration.

(c) The Findings of the Master Are Incomplete in Many Particulars.

In Colorado Exception XIV (p. 15), we have listed some ten respects in which the findings of the Master are either incomplete or inaccurate. No good purpose would be served by taking up each of these in detail. It is sufficient to say that a mere reading of the report of the Master shows its superficial character. Many millions of dollars have been invested in Colorado in an economic development which is dependent upon the flow of the Arkansas river. That civilization should be protected and maintained unless by reason thereof Colorado has in some respect violated the covenants which bind together the states of this Nation. This is not a case between private parties but one between states and it should be considered in the light of the dignity and standing of the states. We say respectfully but with insistence that the report of the Master, incomplete in many details and inaccurate in many others as we have shown herein, should not be used as the basis for a decree which will most vitally affect the civilization which has grown up in the Arkansas basin.

An equitable solution of this controversy cannot be reached without due regard for economic needs. It would seem entirely proper to point out that the natural reluctance to consider and adjudicate future possibilities is greatly strengthened by the impossibility of judging the requirements of the future by a present investigation of complicated issues of fact.

In this regard it is well to recognize the wisdom of a comment made in the article entitled "The Compact Clause of the Constitution—A Study in Interstate Adjustment", found in Volume 34, page 685 of the Yale Law Journal. We are quoting from page 707:

"The attempt to make an equitable apportionment of water among states within a given region has been sought through litigation as though it involved the riparian rights of neighboring individuals. The most informed professional opinion registers the failure of this attempt and the present movement towards solution by interstate treaties is a decisive recognition that the instrument of state-craft in this field is not court but compact. While assuming jurisdiction over these complicated and pervasive interstate difficulties the Supreme Court has recognized its own inadequacy to give relief. Continuous and creative administration is needed; not litigation, necessarily a sporadic process, securing at best merely episodic and mutilated settlements, which leave the central problems for adjustment unsolved."

In the New River Case (*U. S. v. Appalachian Electric Power Co.*, 311 U. S. 377, 423) this Court said:

"To predetermine, even in the limited field of water power, the rights of different sovereignties, pregnant with future controversies, is beyond the judicial function."

This statement is just as applicable to the field of irrigation as it is to the field of water power.

7.

THE DEFENDANTS' EXCEPTIONS TO THE REPORT AND RECOMMENDATIONS OF THE SPECIAL MASTER AMOUNT TO AN ATTEMPT TO REWRITE THE REPORT AND ARE WITHOUT SUPPORT IN THE EVIDENCE AND ARE UNFAIR TO COLORADO.

(a) The Defendants' Theory of Rewriting the Report and Decree with Changes Favorable to Their Interests Is Wrong in Theory and Unsupported By the Evidence and the Law.

Heretofore we have criticized in considerable detail

the Report and Recommendations of the Master. We believe that we have shown that the Report is not supported by the evidence or the law, is superficial, incomplete and inaccurate, and that the Recommended Decree is unworkable, impossible of enforcement and conducive to further litigation.

Such a report, we say, should not furnish the basis for a decree imposing a limitation on the quasi-sovereignty of the state of Colorado. It is so fatally defective that it is not subject to correction by the elimination of a few words here and the addition of a few words there. The Recommendations are basically unsound. They cannot be used as the groundwork upon which to build any workable, equitable apportionment.

(b) The Scheme of Apportionment Contained in the Kansas Exceptions is Inequitable.

The fundamental idea of the Kansas Exceptions is to obtain a decree which will award to Kansas 30.87% of the flow at the index stations at Canon City and the mouth of the Purgatoire as the same accrues day by day. (Exceptions, p. 13). We say this is inequitable because there is no showing that Kansas has received at any time in the past, was receiving at the time of the 1907 decision, or would use if it could receive a flow of any such amount or regularity. We have heretofore pointed out that historically, before the advent of irrigation, the Arkansas river at times went dry in the summer as far west as Rocky Ford, Colorado (Tr. pp. 3361-3374). The records do not disclose that the stream has ever been dry at Canon City. Hence, if Colorado is required under all conditions and at all times to pass a portion of the Canon City flow to Kansas, it will have to improve on nature. There is no showing that at the time of the 1907 decision, when this court expressly held that no relief should be granted against Colorado because it was not then using more than its equitable share of the waters of the stream, Kansas was receiving any such flow as amounted to 30.87% of the so-called index

flow. Since these index flows for the period 1908 to 1938 were of an annual average of 670,380 acre-feet, the application of this percentage figure would require delivery to Kansas of 206,946 acre-feet in the average year. This is in excess of the Master's finding of 185,000 acre-feet. There is no showing that Kansas has ever used this amount of water. Indeed, the evidence is as shown by Colorado Exhibit 213 (App. B, p. 65) that the calculated diversions by Kansas ditches for the period amounted on an average to 84,900 acre-feet annually. There is no showing of any Kansas enterprise under consideration which could utilize this amount of water. Indeed, the awarding to Kansas of this amount of water is to disregard recklessly all principles of beneficial use and protection of existing development.

(c) The Kansas Theory Ignores the Question of Conveyance Losses Between the Index Stations and State Line.

Kansas seeks to obtain 30.87% of the index flows as the water accrues day by day. This water under their contention must be delivered by Colorado at the Colorado-Kansas line. As we have repeatedly shown heretofore, the Arkansas is a losing river and there are substantial conveyance losses. Colorado evidence is that the annual conveyance loss between Pueblo and the state line is 126,000 acre feet. As we have shown above, using average figures, 30.87% of the index flows amount to a little over 206,000 acre-feet on an annual average. To get this amount of water to the state line there must be added 126,000 acre-feet on an annual average to take care of conveyance losses. Thus almost fifty percent of the index flows would in effect be given to Kansas and this in spite of the fact that in its former decision this Court held that Colorado had not exceeded its equitable apportionment even though its recognized ditch priorities were greatly in excess of the average stream flow. In other words, it is apparent from the Kansas contention that they do not accept the 1907 decision but are here trying to re-litigate the entire dispute between the states.

(d) Kansas Is Inconsistent in Claiming A Percentage of the Index Flows As They Accrue and in Also Claiming That the Water be Delivered when Required.

As pointed out above Kansas claims that it should be awarded 30.87% of the stream flows as they accrue at the index stations. This appears from their Exception Thirteen on page 18. By their Exception Nine on page 9 and Exception Twelve on page 16 it is clear they expect water to be delivered to them when required. It seems too obvious to require argument that water which accrues from day to day cannot be delivered when required. The intent of Kansas, however, is not obscure. They are insisting upon both requirements in the hope they may succeed in getting one.

(e) The Kansas Position with Relation To Flood Water Is Unfair.

In its Exception Thirteen (p. 18) Kansas seeks to have the Master's Conclusion of Law Five modified by the addition of the following language:

> "The amount of water passing such station (state line) in daily amounts larger than the accrued amounts as shown by said index stations shall be classed as flood water and shall not constitute a delivery under the allocation herein unless the same shall have been made pursuant to the request of Kansas state water officials."

Similar language is found in Exception Three, page 24. The purpose of this language is to have all accretions to the stream below and not measured by the index stations treated as flood waters. The treatment of the flows of these tributaries as flood waters is contrary to common sense. By the insertion of the quoted language Kansas merely hopes to get additional amounts of water. It must always be remembered that water flows down hill. Once it has crossed the state line, it is gone forever so far as Colorado is concerned. There is no equity in requiring more water to pass to Kansas than can and will

be used in that state. For flood water to be useful for irrigation it must be captured and stored for release in time of need. We have shown that the decreed reservoir capacity in Colorado is 653,427 acre-feet and in Kansas 25,800 acre-feet. Hence, there is more likelihood of flood waters being put to beneficial use in Colorado than in Kansas.

8.

IF A DECREE OF APPORTIONMENT IS TO BE MADE IT SHOULD FOLLOW THE 1933 STIPULATION.

Colorado most earnestly and sincerely asserts that Kansas has failed to show that there has been any material increase in the depletion of the waters of the river by Colorado to the injury of the substantial interests of Kansas, and hence the equitable apportionment made by this Court in its 1907 decision has not been destroyed. Without in any way waiving this position Colorado says further that if the Court for any reason considers that under the Cross-Bill some further definition or determination of the rights of Kansas is required, then a decree granting such relief should follow the principles and provisions of the 1933 Stipulation.

The Governors, the Attorneys General, the State Engineers and the Special Counsel of the two States and the counsel for the defendant, The Finney County Water Users' Association all signed this Stipulation in 1933. Six years later the attorneys for the defendants joined with the attorneys for the complainant in offering the Stipulation as a joint exhibit in this case (Tr. p. 6053). The Stipulation by its terms defines the amount of water necessary to maintain the *status quo* conditions in Colorado below the Caddoa Reservoir and in Kansas. Provision is made for proration at times of deficiency. The conservation storage in Caddoa Reservoir of surplus flows is recognized and it is provided that such conservation benefits shall be divided equally between the two States. The right of Colorado ditches upstream from Caddoa to benefit from Caddoa

storage through the operation of exchange agreements is sanctioned. These are the basic points. The administrative details necessary to carry the stipulation into effect were left to the administrative officials of the two States. Colorado has shown through the presentation of Plan F how the administration of the reservoir and the stream could have worked out for the period 1908 to 1938 had Caddoa Reservoir been in existence and operated under the stipulation. Testimony in connection therewith is that *status quo* conditions could have been maintained and each state could have received on an annual average over 35,000 acre-feet annually in conservation benefits.

Kansas has introduced no evidence directly attacking the stipulation. It has produced no testimony to show that the provisions thereof relative to the *status quo* are wrong or resulted from any mistake. Likewise the provision for the equal division of the benefits of conservation storage has not been disputed. Most surely the representatives of the defendants thought the stipulation was fair in 1933 or they would not have signed it and thought it fair in 1939 or they would not have joined in offering it in evidence. There is no claim of any change of conditions since either of those dates.

Colorado recognizes that the stipulation was neither ratified by the legislatures of the respective states, nor approved by Congress; hence it is not legally binding as an interstate compact. However, it is an agreement made and filed in a case pending in this Court and this Court has on at least three occasions recognized and acted upon stipulations made by the representatives of states in connection with interstate suits (See *Nebraska v. Iowa*, 145 U. S. 519, 12 S. Ct. 976; *Missouri v. Nebraska*, 197 U. S. 577, 25 S. Ct. 580; *Iowa v. Illinois*, 202 U. S. 59, 26 S. Ct. 571). If a decree were entered in accordance with the stipulation, Colorado could have no objection thereto. It entered into the stipulation in good faith and will comply with its terms.

CONCLUSION.

In the 17 arid and semi-arid western states wherein irrigation is practiced, the 1940 census showed over 20,500,000 acres of irrigated land, representing an investment in irrigation works, equipment and water rights of over one billion dollars. The average annual agricultural production from these lands amounts to several hundred million dollars in value. A very large proportion of these lands is dependent on the waters of interstate streams or their tributaries for irrigation. The Colorado, the Columbia, the Snake, the Rio Grande, the Yellowstone, the Missouri, the North Platte, the South Platte, the Arkansas and numerous other streams flow in more than one state and contribute water for irrigation of lands in more than one state. Interstate disputes over these waters are inevitable.[28]

The United States Constitution affords two means of settling such disputes, an original suit in the United States Supreme Court and an interstate compact approved by Congress. The compact method has many advantages and on at least three occasions has been recommended by this Court (*Washington v. Oregon*, 214 U.S. 205, 29 S. Ct. 631, 633; *Minnesota v. Wisconsin*, 252 U. S. 273, 283, 40 S. Ct. 313, 319; *New York v. New Jersey*, 256 U. S. 296, 313, 41 S. Ct. 492, 498).[29]

In a case such as this where the states have failed to compact, the question of the relief which the Court can decree is of primary importance. Since a court is a judicial and not an administrative body, the relief possible is limited to a determination of legal rights and is further limited by the reluctance of the Court to impose any restrictions on the quasi-sovereignty of a state. Hence, any decision is confined to a determination of whether a complaining state

[28]For examples of western river controversies settled by compact see La Plata River Compact, 43 Stat. 796; Colorado River Compact, House Document 605, 67th Congress, Fourth Session; Colo. Session Laws 1923, Chap. 189; South Platte River Compact, 44 Stat. 195; Rio Grande Compact, 53 Stat. 785; Red River Compact, 52 Stat. 150; Republican River Compact, 78th Congress, Ch. 104, Public Law 60, approved May 26, 1943. For a compilation of interstate water compacts see National Resources Planning Board Technical Paper No. 5 "Interstate Water Compacts 1785-1941."

has shown an injury of serious magnitude and what relief may be granted to remedy that specific injury.

Colorado is a state of high mountains which give birth to countless streams that eventually furnish water for the irrigation of lands in at least ten states. Colorado recognizes a solemn obligation to respect the equitable rights of those other states, but at the same time it would be derelict in its duty to its citizens if it did not endeavor to the utmost to protect the civilizations which they have built upon the foundation of irrigation.

Because of its geographical position, Colorado is keenly aware of the difficulties attendant upon a solution of these interstate water controversies. The definition of legal rights is both necessary and important, but to the irrigator a fair and flexible plan of administration is of equal importance. Fundamentally, the water problems of the West are problems of administration. An important natural resource must be so conserved and utilized that the greatest possible benefit is obtained.

Respectfully submitted,

GAIL L. IRELAND,
Attorney General of the State of Colorado,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,

Special Counsel for Complainant,

Denver, Colorado,
September 1, 1943.

FILE COPY

FILED
SEP 15
CHARLES ELMORE CROPLEY
CLERK

No. 5 Original

IN THE

Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

APPENDIX "A" TO BRIEF FOR COMPLAINANT.

ANALYSIS OF EVIDENCE,
AS RELATED TO SPECIAL MASTER'S REPORT.

RELATION OF VOLUMES AND PAGES OF TRANSCRIPT.
LIST OF WITNESSES.
INDEX OF EXHIBITS.

GAIL L. IRELAND,
Attorney General
of the State of Colorado.

SAMUEL L. FAIRLAMB,
Assistant Attorney General.

ARTHUR C. GORDON,
Special Assistant
Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,
Special Counsel for Complainant.

PEERLESS PRINTING COMPANY, DENVER

INDEX

PAGE

CONTENTS OF APPENDIX "A"

Relation of volumes and pages of transcript .. 1,2
List of witnesses for Complainant 3
List of witnesses for Defendants 4, 5
List of Complainant's Exhibits 6-37
List of Defendants' Exhibits 38-52
List of Tables included in Appendix "A" 52a-

ANALYSIS OF EVIDENCE -- INDEX OF SUBJECTS

Water Supply 53-65
Alleged increased depletion by Colorado 65-72
Colorado diversions and Stateline Flows 72-84
Return Flows 84-87
Conditions in Kansas since 1907 87-99
Irrigated acreage and diversions 87-92
Crop production in Kansas 92-99
Water required for irrigation 99
Population in Colorado and Kansas Basins 99-103
Water resources in Kansas Basin 103-114
Variability of River Flow 114-127
Efect of Master's Recommended Decree 128-134
Kansas Rotation Agreement and the 1916 Settlement 134-138
The 1933 Stipulation 138-141
Caddoa Reservoir and its utilization 141-156

IN THE

Supreme Court of the United States

OCTOBER TERM, 1942

No. 5 Original

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

APPENDIX "A" TO BRIEF FOR COMPLAINANT.

ANALYSIS OF EVIDENCE,
AS RELATED TO SPECIAL MASTER'S REPORT.

RELATION OF VOLUMES AND PAGES OF TRANSCRIPT.
LIST OF WITNESSES.
INDEX OF EXHIBITS.

RELATION OF VOLUMES AND PAGES OF TRANSCRIPT.

Volume	Pages
I	1- 168
II	169- 335
III	336- 503
IV	504- 706
V	707- 856
VI	857- 920
VII	921-1121

RELATION OF VOLUMES AND PAGES OF TRANSCRIPT—Continued.

Volume	Pages
VIII	1122-1342
IX	1343-1549
X	1550-1755
XI	1756-1943
XII	1944-2123
XIII	2124-2333
XIV	2334-2525
XV	2526-2694
XVI	2695-2830
XVII	2831-2984
XVIII	2985-3098
XIX	3099-3304
XX	3305-3477
XXI	3478-3597
XXII	3598-3795
XXIII	3796-3978
XXIV	3979-4156
XXV	4157-4331
XXVI	4332-4598
XXVII	4599-4850
XXVIII	4851-5019
XXIX	5020-5211
XXX	5212-5457
XXXI	5458-5676
XXXII	5677-5814
XXXIII	5815-5975
XXXIV	5976-6052
XXXV	6053-6198
XXXVI	6199-6361
XXXVII	6362-6680
XXXVIII	6681-6939
XXXIV	6940-7073

ALPHABETICAL LIST OF WITNESSES FOR COMPLAINANT. (COLORADO)

Name of Witness	Volume Number	Page Examination Started Direct	Cross	Redirect	Recross
Corlett, George M	V	737	767		
Hinderlider, M. C.	I	61			
	II	169	179		
	VI		907		
Newkirk, George S.	XX	3305			
Patterson, C. L.	I	12			
	III	336			
	IV	504			
	V		707		
			789		
	VI		857		
	XVII	2831			
	XVIII	2985			
	XX	3337			
	XXI	3478			
	XXII	3598	3721		
	XXIII		3796		
	XXIV		3979		
	XXV		4157		
	XXVIII			4851	4983
	XXXVI	6321	6327		
	XXXVII	6469			
		6569			
	XXXVIII	6681	6751	6917	6925
Tipton, R. J.	XIX	3099			
	XX	3311			
	XXI	3591			
	XXVI		4332		
	XXVII		4599		
	XXVIII			4995	5019
	XXXIII	5932			
	XXXVI	6331	6353	6361	

ALPHABETICAL LIST OF WITNESSES FOR DEFENDANT. (KANSAS)

Name of Witness	Volume Number	Page Examination Started Direct	Cross	Redirect	Recross
Abbott, A. J.	VII	926	954	982	986
				987	988
				988	
Baldwin, J. E.	VIII	1179	1183	1189	
Bentrup, Charles	VIII	1229	1233	1245	1247
				1248	
Bland, L. M.	VIII	1310	1311		
Boomer, Frank P.	VII	1070	1074	1080	1080
Burtis, Arthur H.	VIII	1172	1176		
Carter, W. O.	VIII	1312			
Craig, James	VIII	1153		(Deposition)	
	XIV	2414	2464	2500	
		2511			
Craig, John	VIII	1213	1219		
Danner, C. A.	VII	1081	1085	1096	
Finnup, Geo. W.	VIII	1265			
Grable, T. E.	VII	1021	1027	1042	
Hammond, J. B.	VIII	1314	1317	1327	
Hurst, A.	VIII	1147			
Jones, Roy	VII	1060	1068		
Jones, Thomas M.	VII	1096	1104	1112	1117
Knapp, George S.	IX	1343			
	X	1753			
	XIII	2258			
	XIV	2334			
	XV		2646		
	XVI		2695		
	XXIX	5020			
	XXX		5212		
	XXXI		5458		
	XXXII		5677		
	XXXIII		5815		
			5940		
	XXXIV			5976	
	XXXV				6060

Name of Witness	Volume Number	Page Examination Started Direct	Cross	Redirect	Recross
	XXXVI				6199
	XXXIX	6943	7033	7071	
Lee, M. E.	VIII	1301	1302		
McClurkin, R. J.	VIII	1145	1147		
McDowell, O. E.	VIII	1191	1195	1198	1198
Meeker, R. I.	IX	1345			
	X	1550			
	XI	1756	1759		
	XII		1944		
	XIII			2124	
	XV				2526
				2628	
Nash, E. D.	VIII	1258	1260		
Olomon, C. P.	VII	1044	1049	1057	1058
				1060	1060
Price, E. M.	VIII	1337	1340		
Reilly, P. C.	X	1751			
Rich, Paul	VIII	1328	1331		
Sheaks, D. A.	VII	991	999	1016	1020
				1021	
Simpson, O. H.	VIII	1122	1129	1144	
Sinclair, J. W.	VIII	1201	1206	1211	
Smith, E. A.	VIII	1363	1306		
Wagner, F. A.	VIII	1266	1276	1294	1300
White, A. D.	VIII	1248	1254	1257	

INDEX OF COMPLAINANT'S (COLORADO) EXHIBITS

Exhibit No.		Page of Transcript	Volume of Transcript
1	Transcript of record, Case No. 5578, U. S. District Court	7	I
2	Transcript of record, Case No. 6633, U. S. District Court	9	I
3	Transcript of record, Case No. 7493, U. S. District Court	11	I
4	U.S.G.S. Base Map of Colorado, compiled 1922, scale 1/500,000	31	I
5	U.S.G.S. Base Map of Kansas, compiled 1921, scale 1/500,000	32	I
6	Photostatic reproduction of U.S.G.S. Base Maps of Colorado and Kansas combined. Outlined thereon are boundaries of Arkansas River Basin from headwaters to vicinity of Arkansas City, Kansas	35	I
7	Photostatic reproduction of U.S.G.S. Base Maps of Colorado and Kansas combined. Counties and county boundaries colored thereon to show counties of both States wholly or in part drained by Arkansas River	37	I
8	Photostatic reproduction of U.S.G.S. Base Maps of Colorado and Kansas combined. Principal tributary valleys shown in colors	38	I
9	Photostatic reproduction of U.S.G.S. Base Maps of Colorado and Kansas combined. General topography, contour interval 1,000 feet, shown in colors	41	I

Exhibit No.		Page of Transcript	Volume of Transcript
10	Photostatic reproduction of U.S.G.S. Base Maps of Colorado and Kansas combined. General geological formations shown in colors	43	I
11	Photostatic reproduction of U.S.G.S. Base Maps of Colorado and Kansas combined. Average annual precipitation shown by coloring between isohyetals	51	I
12	Photostatic reproduction of U.S.G.S. Base Maps of Colorado and Kansas combined. Water Districts of Division No. 2, Colorado, shown thereon by colored boundary lines	54	I
13	Photostatic reproduction of U.S.G.S. Base Maps of Colorado and Kansas combined. Lands irrigated by ditches and from reservoirs in Colo. and Kans. shown in colors	54	I
14	Photostatic copy of Page 53, Climatological Data: Colorado Section, 1928	56	I
15	Photostatic copy of Page 102, Climatological Data: Kansas Section, 1928	57	I
16	Photostatic copy of Page 103, Climatological Data: Kansas Section, 1928	58	I
17	Photostatic copy of Page 97, Climatological Data: Kansas Section, Volume 42, No. 13, 1928	90	I
18	Precipitation in Kansas in Inches, 1887-1928. Annual Precipitation in Eastern, Middle, and Western Kansas and Whole State. From U.S.W.B., Vol. XLII	92	I

Exhibit No.		Page of Transcript	Volume of Transcript
19	Precipitation in Colorado, 1888-1928. Annual precipitation for Whole State and for Arkansas River. From U.S. W.B. Climatological Data, Vol. XXXIII, No. 13, 1928	96	I
20	Western Kansas and Arkansas Valley in Colo. compared. Average precipitation record by years, 1888-1928. From Climatological Data, Vol. XLII, No. 13, 1928	99	I
21	Bureau of the Census, Bulletin 16. Irrigation in the United States: 1902. Photostatic copy of Table 9, page 16, showing Kansas in Semi-arid region.	154	I
22	Detailed Statement of Assessment for 1926. From records of State Tax Commission published in Colo. Year Book, 1927, pp. 166 and 167. (One page table showing data for counties in Arkansas Basin.)	163	I
23 & 24	Farm Value of Crops, 1926, from Colo. Year Book, 1927, pp. 58 and 59 and Farm Value of Crops, 1924 from Colo. Year Book, 1925, p. 56. (Photostatic copies — 2 pages — see Colo. Year Books for 1925 and 1927.)	162-163	I
25	Relief Map of U. S. showing Mississippi River Basin. Photostatic copy of Plate XVI in 22nd Annual Report, Part IV, U.S.G.S.	344	III
26	Map showing location of river stations in eastern half of U. S. in 1900. Photostatic copy of Figure 2, page 27, Part IV of 22nd Annual Report, U.S.G.S.	380	III

Exhibit No.		Page of Transcript	Volume of Transcript
27	Map showing location of river stations in western half of U. S. in 1900. Photostatic copy of Figure 1, page 26, Part IV of 22nd Annual Report, U.S.G.S.	380	III
28	Topographic Map of Arkansas Basin in Colorado showing reservoir sites surveyed as of 1891. Photostatic copy of map in Part III, 13th Annual Report of U.S.G.S.	379-380	III
29	Survey of Reservoir Sites in Colo. Photostatic copy of tables on pages 31 and 32 of Part IV, 20th Annual Report, U.S.G.S.	383	III
30	Data as to Areas of Counties in Colorado involved in Arkansas River Basin	410	III
31	Data as to Areas of Counties in Kansas involved in Arkansas River Basin	411	III
32	Summary of Tributary Data—Arkansas Basin in Colorado. Shows lengths, widths and areas of Arkansas River tributaries.	493	III
33	Tributaries of Arkansas River in Kansas. Shows lengths, widths and areas of tributaries	500	III
34	Areas of Geological Formations—Arkansas Basin, Colorado.	642	IV
35	Areas of Geological Formations—Arkansas Basin, Western Kansas	642	IV
36	Areas of Geological Formations—Arkansas Basin, Central Kansas	642	IV

Exhibit No.		Page of Transcript	Volume of Transcript
37	Monthly Distribution of Normal Precipitation over the States of Colorado and Kansas. Summary of data in Colo. Exhibits 14, 15 and 16.....	563	IV
38	Monthly Distribution of Normal Precipitation over the Three Divisions of Kansas. Summarized from Colo. Exhibits 15 and 16.....	563	IV
39	Normal Precipitation at all Stations Along Arkansas River in Colorado. Shows U.S.W.B. normals to 1923 and to 1928.....	565	IV
40	Monthly Distribution of Precipitation along Arkansas River in Colo. Shows monthly and annual precipitation at main river stations.....	567	IV
41	Comparison of Precipitation along Arkansas River in Colorado, and in Western and Central Kansas. Shows monthly distribution in inches and in percent of annual.....	570	IV
42	Decree Entries and Amounts Appropriated in Colorado by Water Districts in Irrigation Division No. 2. (Arkansas River Basin).....	642	IV
43	Areas of the Counties of Kansas. Shows counties of Western, Central and Eastern Kansas Divisions Counties in Western and Central Kansas grouped according to their location with respect to the Arkansas River..	2858	XVII
44	Population of State of Kansas. Shows Western, Central, and Eastern Divisions and State Totals.....	2858	XVII
45	Graph showing Growth of Population State of Kansas and its Divisions..	2861	XVII

Exhibit No.		Page of Transcript	Volume of Transcript
46	Population of Central Kansas, 1881-1930—Counties grouped with respect to Basin of Arkansas River	2867	XVII
47	Graph showing Growth in Population of Counties of Central Kansas—1880-1930	2869	XVII
48	Graph showing Growth in Population, Counties of Central Kansas Located Wholly or Partly in Arkansas Basin 1880-1930	2873	XVII
49	Population of Western Kansas, 1881-1930. Counties grouped with respect to Basin of Arkansas River	2877	XVII
50	Graph showing Growth in Population of Counties of Western Kansas—1880-1930	2879	XVII
51	Graph showing Growth in Population of Counties of Western Kansas Located Wholly or Partly in Arkansas Basin—1880-1930	2888	XVII
52	Population of Finney County, Kansas—and other Western Kansas Counties on Arkansas River, 1880-1930	2909	XVII
53	Acres of Field Crops in Kansas, 1881-1930. Eastern, Central and Western Divisions and State Totals	2924	XVII
54	Acres of Field Crops in Kansas, 1881-1930. Graph compiled from values in Colo. Ex. 53	2927	XVII
55	Acres of Field Crops in Central Kansas, 1881-1930. Counties grouped with respect to Basin of Arkansas River	2932	XVII

Exhibit No.		Page of Transcript	Volume of Transcript
56	Acres of Field Crops in Central Kansas, 1881-1930. Graph compiled from values in Colo. Ex. 55	2936	XVII
57	Acres of Field Crops in Western Kansas, 1881-1930. Counties grouped with respect to Basin of Arkansas River	2943	XVII
58	Acres of Field Crops in Western Kansas, 1881-1930. Graph compiled from values in Colo. Ex. 57	2947	XVII
59	Acres of Field Crops in Counties of Western Kansas Wholly or Partly Inside Arkansas River Basin. Graph compiled from values in Colo. Ex. 57.	2951	XVII
60	Wheat in Kansas, 1881-1931. Table shows acreage, production, value, average yield and average value per bushel	2955	XVII
61	Average Value and Yield of Wheat in State of Kansas. Graph compiled from data in Kans. State Board of Agric., 27th Biennial Report, p. 538.	2960	XVII
62	Corn in Kansas, 1881-1930. Table shows acreage, production, value, average yield and average value per bushel	2962	XVII
63	Average value and Yield of Corn in State of Kansas. Graph compiled from data in Kans. State Board of Agric., 27th Biennial Report, p. 539.	2964	XVII
64	Values of Agricultural Products of Kansas. Table shows value of field crops, value of all other products, and total value for years 1881-1930	2967	XVII
65	Values of Kansas Field Crops by State Divisions, 1881-1930	2974	XVII

Exhibit No.		Page of Transcript	Volume of Transcript
66	Values of Field Crops produced in Central Kansas. Counties grouped with respect to Basin of Arkansas River	2980	XVII
67	Values of Field Crops produced in Western Kansas. Counties grouped with respect to Basin of Arkansas River	2989	XVIII
68	Summary by Decades of Values and Acres of Field Crops of Kansas. Values for Central and Western Kansas shown by county groups located with respect to Arkansas Basin	3003	XVIII
69	Total Assessed Valuation of All Property in Kansas. Valuations shown are averaged by decades from 1882 to 1930. Counties grouped with respect to Basin of Arkansas River	3013	XVIII
70	Assessed Valuations of Various Classes of Property in Kansas. Data shown by decades from 1882 to 1930 for Eastern, Central and Western Divisions of Kansas	3016	XVIII
71	Assessed Valuations of Lands in State of Kansas. Data shown by decades from 1882 to 1930. Counties grouped with respect to Basin of Arkansas River	3022	XVIII
72 72a 72s	Series of 19 Maps showing Territory Boundaries and State and County Boundary changes in Colo. from 1861 inc. to 1913	3042	XVIII
73	Population Data—State of Colo. and Counties in Basin of Arkansas River, 1880-1930	3048	XVIII

Exhibit No.		Page of Transcript	Volume of Transcript
74	Rates of Gain in Population. Comparison of gains 1880 to 1905 and 1905 to 1930 of U. S., Kansas and Colorado. Also of Divisions of Kansas and Southeastern Colorado and certain counties grouped with respect to Basin of Arkansas River	3057	XVIII
75	Acres of Field Crops Harvested in State of Colorado and Counties of Arkansas Basin, 1924 to 1930	3065	XVIII
76	Acres of Field Crops Harvested, Average of Seven Year Period 1924 to 1930. Data shown for States of Kansas and Colorado and for certain counties grouped with respect to the Basin of the Arkansas River	3072	XVIII
77	Values of Field Crops Harvested in State of Colorado and Counties of Arkansas Basin; 1924 to 1930	3075	XVIII
78	Average Values of Field Crops Harvested, Seven Year Period 1924-1930. Data shown for States of Kansas and Colorado and for certain counties grouped with respect to the Basin of the Arkansas River	3083	XVIII
79	Assessed Valuations of Counties of Southeastern Colorado, 1921-1930 and Ten Year Average	3085	XVIII
80	Comparative Data as to Total Assessed Valuations in Kansas and Colorado and Portions of Each State. Average data, 1921-1930, shown for States of Kansas and Colorado and for certain counties grouped with repect to the Basin of the Arkansas River	3090	XVIII

Exhibit No.		Page of Transcript	Volume of Transcript
81	Assessed Valuations of Agricultural Lands of Colorado and Counties of Southeastern Colorado, 1921 to 1930 and 10 year average	3093	XVIII
82	Comparative Data as to Assessed Valuations of Lands of the States of Kansas and Colorado and the Counties of the Arkansas Basin in Each State. Data show averages, 1921-1930, for counties grouped with respect to Arkansas Basin	3098	XVIII
83	Map of Western U. S., compiled by Bureau of Reclamation, used as base to show areas where witness, R. J. Tipton, had made consumptive use studies	3117	XIX
84	Consumption of Water in Rio Grande Basin, Colorado, 1890-1934	3122	XIX
85	Consumption of Water in South Platte Basin above Kersey, Colorado, May-September Season, 1901-1932	3128	XIX
86	Apparent Water Consumption Elephant Butte, N. Mex. to El Paso, Texas, 1915-1933	3133	XIX
87	Measure of Consumption of Water in Rio Grande Basin Between San Marcial, N. Mex. and El Paso, Tex., 1897-1933	3137	XIX
88	Trend of Consumptive Use, San Marcial to El Paso. Graph showing data given on Colo. Ex. 87	3140	XIX

Exhibit No.		Page of Transcript	Volume of Transcript
89	Trend of Consumptive Use in Various Regions. Graph showing trends in Rio Grande Basin of Colo., Rincon and Mesilla Valleys of N. Mex., Arkansas Basin in Colo., Arkansas Basin—Pueblo to Holly (May-Sept.) and South Platte above Kersey (May-Sept.)	3143	XIX
90	Yearly Water Consumption—Irrigated Lands in Arkansas Basin in Colo., 1895-1930. Data taken from Kansas Ex. 61 and values smoothed by using progressive series of years	3153	XIX
91	Daily canal diversions, Pueblo to Holly—1904. From Arkansas Valley Ditch Association records	3153	XIX
92	Daily canal diversions, Pueblo to Holly—1906. From Arkansas Valley Ditch Association records	3153	XIX
93	Daily canal diversions, Pueblo to Holly—1907. From Arkansas Valley Ditch Association records	3153	XIX
94	Daily canal diversions, Pueblo to Holly—1908. From Arkansas Valley Ditch Association records	3153	XIX
95	Daily canal diversions, Pueblo to Holly—1909. From Arkansas Valley Ditch Association records	3153	XIX
96	Daily canal diversions, Pueblo to Holly—1910. From Arkansas Valley Ditch Association records	3153	XIX
97	Daily canal diversions, Pueblo to Holly—1911. From Arkansas Valley Ditch Association records	3153	XIX

Exhibit No.		Page of Transcript	Volume of Transcript
98	Total Diversions from Arkansas River—Pueblo to Holly, 1904-1932. Shows monthly diversions, Jan. to July	3161	XIX
98a	Total Diversions from Arkansas River—Pueblo to Holly, 1904-1932. Shows monthly diversions, Aug. to Dec.	3161	XIX
99	Annual vs. May-Sept. Diversions—Pueblo to Holly	3161	XIX
100	Monthly Diversions (May, June and July), Pueblo to Holly, 1904-1932. Graph showing acre feet diverted each month	3161	XIX
100a	Monthly diversions (August and Sept.) Pueblo to Holly, 1904-1932. Graph showing acre feet diverted each month	3161	XIX
101	Diversions Pueblo to Holly—Annual and May-Sept., 1904-1932. Graph showing acre feet diverted annually and seasonally each year	3161	XIX
102	Diversions Pueblo to Holly vs. Discharge of Arkansas River. Graph showing 6 year progressive averages, 1904-1932, of May-Sept. diversions Pueblo to Holly and Arkansas River at Pueblo plus Bessemer and minor canal diversions, May-Sept.	3166	XIX
103	Discharge of Arkansas River at Pueblo vs. Diversions Pueblo to Holly. Graph showing 6 year progressive averages, 1904-1932, of Annual diversions Pueblo to Holly and Annual discharge of Arkansas River at Pueblo plus diversions around station	3168	XIX

Exhibit No.		Page of Transcript	Volume of Transcript
104	Test of Conclusions of Kansas witness, R. I. Meeker, re Consumption in Arkansas River Basin. Tabulation showing apparent return flow by using consumptive use rates in Kans. Ex. 60 and 61 and diversions in Colo. Ex. 98 and 98a, 1904-1930.....	3171	XIX
105	Test of Meeker's Estimate of Water Consumption in Arkansas Basin, 1904-1930. Graph showing annual diversions Pueblo to Holly minus Meeker's assumed consumption Pueblo to Holly.....	3173	XIX
106	Arkansas River Discharge at Canon City vs. Discharge at Pueblo, 1895-1932. Annual values in acre feet shown and smoothed values shown by use of 6 year progressive averages..	3189	XIX
107	Diversions by Arkansas Valley Conduit (C. F. & I.), 1904-1932. Shows monthly, annual and May-Sept. values	3189	XIX
108	Flow of Arkansas River at Canon City. vs. Flow at Pueblo, 1895-1932. Graph showing smoothed values given in Colo. Ex. 106.....	3189	XIX
109	Discharge of Arkansas River at Amity Dam vs. Discharge at Holly. May-Sept., 1908-1916.....	3192	XIX
110	Exchange of Water from Lake Meredith, 1904-1932. Shows monthly, annual, and May-Sept. values.....	3194	XIX
111	Exchange Water from Dye Lake and Holbrook Reservoir, 1904-1932. Shows monthly, annual and May-Sept. values	3194	XIX

Exhibit No.		Page of Transcript	Volume of Transcript
112	Estimated Return Flow—Pueblo to Holly, 1904-1932. Graph showing estimated annual and May-Sept. values.	3200	XIX
113	Discharge of Salt Creek at Pueblo, 1904-1932. Shows monthly, annual and May-Sept. values.....	3200	XIX
114	Deductions to be Made from Total May-Sept. Inflow between Pueblo and Holly to arrive at Tributary Inflow, 1904-1932	3202	XIX
115	Estimated Total Consumption of Water, May to Sept., incl., between Pueblo and Holly, 1904-1932.....	3205	XIX
116	Indicated Consumption Pueblo to Holly--Partial vs. Total, Regulation Return, 1922-1925. Graph showing annual and May-Sept. consumption Pueblo to Holly with total and partial regulation returns considered	3205	XIX
117	Deductions to be Made from Total Annual Inflow between Pueblo and Holly to Arrive at Tributary Inflow, 1911-1932.....	3207	XIX
118	Estimated Total Consumption of Water, Pueblo to Holly, 1904-1932...	3210	XIX
119	May-Sept. vs. Annual Consumption—Main Stem Arkansas Pueblo to Holly, 1911-1932	3210	XIX
120	Consumption Pueblo to Holly and Water Supply at Pueblo, 1904-1932. Hydrograph showing May-Sept. consumption Pueblo to Holly and May-Sept. discharge of Arkansas River at Pueblo corrected for May-Sept. diversions of Bessemer and minor canals..	3214	XIX

Exhibit No.		Page of Transcript	Volume of Transcript
121	Consumption Pueblo to Holly vs. Water Supply at Pueblo, 1904-1933. Graph showing 6 year progressive averages of May-Sept. consumption and discharge	3216	XIX
122	Annual Consumption Pueblo to Holly vs. Water Supply at Pueblo, 1904-1932. Graph showing 6year progressive averages of annual consumption and discharge	3217	XIX
123	Map of a portion of Arkansas Basin along Main Stem in Colo. Shows canals, irrigated lands and drainage districts	3238	XIX
124	Water Recovery by Drains, Pueblo to Holly, 1922. Shows monthly, annual and May-Sept. values	3244	XIX
125	Water Recovery by Drains Pueblo to Holly, 1923. Shows monthly, annual and May-Sept. values	3244	XIX
126	Water Recovery by Drains, Pueblo to Holly, 1924. Shows monthly, annual and May-Sept. values	3244	XIX
127	Water Recovery by Drains, Pueblo to Holly, 1925. Shows monthly, annual and May-Sept. values	3244	XIX
128	Water Recovery by Drains, Pueblo to Holly, 1926. Shows monthly, annual and May-Sept. values	3244	XIX
129	Discharge of Holly Drain near Coolidge, Kans., 1924-1932. Shows monthly, annual and May-Sept. values	3244	XIX

Exhibit No.		Page of Transcript	Volume of Transcript
130	Irrigation Requirements--Net Duty on Land vs. Precipitation on Various projects. Sho vs data for 31 projects or areas in W estern U. S.....	3254	XIX
131	Hydrographs showing Diversions to Colorado Canal, 1912-1932. Hydrographs show segregations of river water, reservoir water and/or transmountain water diverted. Also assumed ideal demand and deficiencies.	3266	XIX
132	Crop Production vs. Net Duty of Irrigation Water, Cache La Poudre Basin. Reprint of graphs on pages 59 and 61 of U. S. D. A. Bulletin No. 1026	3283	XIX
133	Cache La Poudre and Thompson River Basins, Diversions vs. Assumed Requirements—Shortages and Surpluses, 1914-1931	3285	XIX
134	Map of Proposed Northern Transmountain Diversion	3289	XIX
135	Irrigation Requirements of Arid and Semi-Arid Lands. Photostatic copy of page 41, Table 8, U. S. D. A. Technical Bulletin No. 36, 1928 by Samuel Fortier	3293	XIX
136	Map of Bear Valley Reservoir Site, Kearney and Grant Counties, Kansas	3310	XX
137	Map of Proposed Inlet Ditch to Bear Valley Reservoir. Shows ditch alignment	3310	XX
138	Profile of Proposed Inlet Ditch to Bear Valley Reservoir.....	3310	XX

Exhibit No.		Page of Transcript	Volume of Transcript
139	Map of Canals, Reservoirs and Reservoir Sites—Arkansas River in Western Kansas. Shows Lake McKinnie and its proposed enlargement and proposed Bear Valley, Kendall, West Kansas, Syracuse and Kans.-Colo. Reservoir sites	3320	XX
140	Arkansas River at Garden City, Kansas, 1922-1933. Booklet of 11 pages composed of photostatic copies of pages from "Surface Waters of Kansas — Kansas Water Commission" and from Water Supply Papers of U. S. G. S.	3320	XX
141	Discharge of Arkansas River at Garden City., Kans., 1923-1932. Shows monthly and annual values; a 10-year mean and a 1926-1932 mean	3323	XX
142	Water Available for Storage from Arkansas River in Off Channel Reservoirs in Western Kansas by Canal with 800 sec. ft. capacity, 1923-1932. Shows monthly and annual values; 10-year mean and 1926-1932 mean	3323	XX
143	Water Available for Storage from Arkansas River in Off Channel Reservoirs in Western Kansas by Canal with 1000 sec. ft. capacity, 1923-1932. Shows monthly, and annual values; 10-year mean and 1926-1932 mean	3323	XX
144	Water Available for Storage from Arkansas River in Off Channel Reservoirs in Western Kansas by Canal with 1200 sec. ft. capacity, 1923-1932. Shows monthly and annual values; 10-year mean and 1926-1932 mean	3323	XX

Exhibit No.		Page of Transcript	Volume of Transcript
145	Storage Conditions in Principal Reservoirs in Division No. 2 on First of the Month—1932	3336	XX
146	Operation of Reservoirs in the Arkansas River Basin, Colorado, 1926-1932. Booklet of 7 sheets, one for each year 1926-1932, showing monthly changes in storage content of principal Arkansas Basin reservoirs; maximum storage each year; Total stored in acre feet; Total releases in acre feet; and amounts and dates of reservoir decrees	3337	XX
147	Summary of Operation of Principal Reservoirs in Arkansas Basin, Colorado, 1926-1932. Shows total monthly changes in storage content; net change for each year; maximum in storage each year; and total amount stored during each year	3337	XX
148	Contract between U. S. Irrigating Company, et al. and Graham Ditch Company, et al. (1916 settlement)	3517	XXI
149	Petition for Intervention by Finney County Water Users Assn. in case No. 5578, U. S. District Court	3518	XXI
150	Daily Stream Flow Records of Arkansas River at Canon City, Pueblo and Stateline; Wild Horse Creek at Holly and Holly Drain near Coolidge, Kans.—all for 1932	3591	XXI
151	Daily Canal diversions, Pueblo to Holly—1931. From Arkansas Valley Ditch Association records	3593	XXI

Exhibit No.		Page of Transcript	Volume of Transcript
152	Daily Canal diversions, Pueblo to Holly—1932. From Arkansas Valley Ditch Association records	3593	XXI
153	Topographic Map of South Central Colorado on which are sketched Existing, Proposed and Possible Transmountain Diversions Projects	3603	XXII
154	Water Supply Available to Priority No. 2 (Kans. Farmer's Ditch): Recorded Diversions under Rotation Agreement and Water Lost Due to Rotation Agreement. Period 1915-1928 incl.	3635	XXII
155	Comparison of Results—Calculated Total Water Production in Arkansas Basin in Colorado, 1922-1925, showing Approx. Extent of Error in Meeker Calculations	3650	XXII
156	Comparison of Results—Calculated Tributary Inflow to Arkansas River, Canon City to Holly, 1922-1925, showing Approx. Extent of Error in Meeker calculations	3653	XXII
157	Major Reservoir Decrees—In Operation Jan. 1, 1932, Irrigation Division No. 2—State of Colorado	3661	XXII
158	Flow of Arkansas River at Pueblo and Holly and Natural Contributions of Tributaries and Quantities Consumed and Unconsumed, 1922-1925	4853	XXVIII
159	Comparison of Results—Water Consumption Along Arkansas River in Colorado, 1922-1925. Shows results of Meeker and Amsley investigations and differences between the two	4867	XXVIII

Exhibit No.		Page of Transcript	Volume of Transcript
160	Irrigated Acreage and Consumptive Use of Water in Arkansas Valley in Colorado, 1922-1925, as Testified to by R. I. Meeker for Kansas. Shows irrigated acreage, water consumption and consumptive use per acre for (a) Lands above Canon City, (b) Land along Tribs., Canon City to Holly and (c) Lands along Arkansas River Canon City to Holly.....	4877	XXVIII
161	Tributary Inflows Canon City to Pueblo, 1922-1925, as Forecast for Average Year by Amsley Report of 1922 and as Calculated each Year, 1922-1925, from Recorded Stream Flows and Diversion Quantities.....	4892	XXVIII
162	Comparative Results—Tributary Inflow Canon City to Holly, 1922-1925. Shows differences between Meeker and Amsley calculations.....	4896	XXVIII
163	Land Classifications for Tax Purposes, 1933, for Counties Along Arkansas River in Colorado, data shown for Prowers, Bent, Otero, Crowley and Pueblo counties.....	4923	XXVIII
164	Acreage, Production and Value of Wheat in Colo. and Kans., 1881-1930.	4930	XXVIII
165	Wheat in Colo. and Kans.—Comparative Decade Averages, 1881-1930. Data shows acreage, yield, production, price, value and value per acre..	4937	XXVIII
166	Wheat Acreage, Yield and Production in 1933 in Five Counties Along Arkansas River in Colorado. Shows irrigated and non-irrigated wheat data for Prowers, Bent, Otero, Crowley and Pueblo Counties.....	4939	XXVIII

Exhibit No.		Page of Transcript	Volume of Transcript
167	Acreage, Production and Value of Corn in Colo. and Kans., 1881-1930.	4944	XXVIII
168	Corn in Colo. and Kans.—Comparative Decade Averages, 1881-1930. Data shows acreage, yield, production, price, value and value per acre.	4945	XXVIII
169	Corn Acreage, Yield and Production in 1933 in Five Counties Along Arkansas River in Colorado. Shows irrigated and non-irrigated corn data for Prowers, Bent, Otero, Crowley and Pueblo Counties	4946	XXVIII
170	Prices of Wheat and Corn in Colo. and Kans. During and after the War. Shows annual prices 1917-24, 10 year average 1921-1930 and 7-yr. average 1924-30	4950	XXVIII
171	Comparative Annual Value per Acre of Field Crops in Off-Channel Counties of Western Kans. and Eastern Colo., 1924-1930. Total acreage and total values	4958	XXVIII
172	Total Crop Acreages and Total Crop Values in Counties Along Arkansas River in Colorado and Western Kansas, Average for 1924-30. Shows summary of data from Colo. Ex. 75 and 77 for Lake, Chaffee, Fremont, Pueblo, Crowley, Otero, Bent and Prowers Counties in Colo. and from Colo. Ex. 58 and 67 for Hamilton, Kearney, Finney, Ford and Gray Counties, Kansas.	4966	XXVIII

Exhibit No.		Page of Transcript	Volume of Transcript
173	Approximate Segregation of Total Crop Statistics as Between Irrigated and Non-Irrigated Types, Average for 1924-30, for Counties on Arkansas River in Colorado and Western Kansas. Shows data for same groups of counties as given in Colo. Ex. 172	4969	XXVIII
174	May-Sept. vs. Annual Tributary Flow Pueblo to Holly, 1911-1932	5001	XXVIII
175	May-Sept. Discharge of Fountain and Purgatoire Rivers vs. Estimated Tributary Flow Pueblo to Holly, 1904-32	5003	XXVIII
176	Annual Discharge of Fountain and Purgatoire Rivers vs. Estimated Tributary Flow Pueblo to Holly, 1922-1932	5005	XXVIII
177	Consumption Pueblo to Holly without Part Regulation Return and Water Supply at Pueblo, 1904-1932. Shows May-Sept. values plotted for each year and smoothed by plotting 5 year progressive averages	5007	XXVIII
178	Consumption Pueblo to Holly without Part Regulation Return and Water Supply at Pueblo, 1911-1932. Shows annual values plotted for each year and smoothed by plotting 5-year progressive averages	5009	XXVIII
179	Stipulation of Dec. 1933 as to Caddoa Reservoir	6053	XXXV

Exhibit No.		Page of Transcript	Volume of Transcript
180	Discharge of Arkansas River at Holly for 1910. Photostatic copy of State Engineer's original worksheet showing handwritten corrections by R. I. Meeker — accounting for ice conditions in Jan. & Feb.	6325	XXXVI
181	Six-Year Averages of Annual Flow —Arkansas River at Canon City and Stateline, 1888 and 1908 to 1932. Shows data from Kans. Ex. 13 and 17 and ratio of Stateline flow to Canon City flow	6325	XXXVI
182	Six Year Averages of Summer Flow —Arkansas River at Canon City and Stateline, 1888 and 1908 to 1932. Shows data from Kans. Ex. 13 and 17 and ratio of Stateline flow to Canon City Flow.	6327	XXXVI
183	Runoff vs. Precipitation — Kansas River Basin above Topeka and Marais Des Cygnes Basin above Ottowa. Graph of data from Kans. Ex. 116 and 117.	6353	XXXVI
184	Arkansas River Runoff and Plains Precipitation, 1904-1932. Graph of data from Colo. Ex. 106 and 115 and Kans. Ex. 50.	6353	XXXVI
185	Discharge of Arkansas River at Canon City vs. Stateline Outflow, 1904-1932 period. Shown by 6 year averages. Data from Colo. Ex. 106 and Kans. Ex. 50.	6353	XXXVI
186	Stateline Outflow vs. Precipitation, 1904-1932, Annual and May-Sept. values. Shown as 6 year averages of data in Colo. Ex. 115 and Kans. Ex. 50.	6353	XXXVI

Exhibit No.		Page of Transcript	Volume of Transcript
187	Deduced Stateline Outflow on Basis of Meeker's Assumed Consumption vs. Precipitation, 1904-14 and 1918-30 shown in 6 year averages.	6353	XXXVI
188	Deduced Stateline Outflow on Basis of Tipton's Assumed Consumption vs. Precipitation, 1904-14 and 1918-32 shown in 6 year averages.	6353	XXXVI
189	Available Inflow, Consumption of Inflow, and Residual Flow at San Marcial, Middle Rio Grande Valley, Otowi Bridge to San Marcial, 1890-1935.	6353	XXXVI
190	Precipitation Data. Shows average monthly and annual precipitation for years of record prior to 1931; monthly and annual precipitation 1931-41; average monthly and annual values for 1931-41 period. For 23 stations in Colorado and 11 stations in Western Kansas	6485-6489	XXXVII
191	Temperature Data. Shows average monthly and annual temperature for years of record prior to 1931; monthly and annual temperatures 1931-41; average monthly and annual values for 1931-41 period. For 19 stations in Colorado and 10 stations in Western Kansas	6493	XXXVII
192	Stream Flow Records for years 1931-1941, incl. for Arkansas River at Canon City, Pueblo, La Junta, Caddoa, Lamar, Holly, Syracuse and Garden City; for Purgatoire River near Mouth (Highland Dam); and for Holly Drain near Stateline.	6499-6500	XXXVII

Exhibit No.		Page of Transcript	Volume of Transcript
193	Stream Flow Data. Shows average monthly and annual discharge for years of record prior to 1931 (from Kans. Ex. 13, 14, 15, 16 and 17, or from all published records); monthly and annual discharge 1931-41; average monthly and annual values for 1931-41 period. For Arkansas River at Canon City, Pueblo, La Junta, Lamar, Stateline, Syracuse and Garden City and for Purgotoire River near Las Animas.	6509, 6542	XXXVII
194	Diversion Data. Shows average monthly and annual diversions from Arkansas River in Colo. and Kans. by Stream Sections (Parkdale to La Junta to Caddoa, Caddoa to Stateline and Stateline to Garden City) for years of record prior to 1931; monthly and annual diversions (same stream sections) for years 1931-1941; average monthly and annual diversions for 1931-41 period. Also average monthly and annual transmountain diversions into Arkansas Basin for years prior to 1931 (from Kans. Ex. 21); monthly and annual transmountain diversions for years 1931-41; and average monthly and annual values for 1931-41 period	6513-6562	XXXVII
195	Storage Data. Shows average storage on first of month for years prior to 1931 (from Kans. Ex. 66); storage on first of month for years 1931-40; and average storage on first of month for 1931-40 period. For 16 principal reservoirs of Arkansas Basin in Colorado	6528, 6540-6542	XXXVII

Exhibit No.		Page of Transcript	Volume of Transcript
196	Irigated Acreage Data. Shows average irrigated acreage in Colorado by Water Districts, Division No. 2, for years of record prior to 1931; irrigated acreage by Water Districts for years 1931-1940; and average values by Water District for 1931-40 period. Also data as to irrigated and irrigable areas in Arkansas Basin of Colo. and Kans. from 16th Census of U. S. for 1920, 1930 and 1940. Also data as to irrigated areas in Scott County, Kans. from 16th Census of U. S. and U.S.G.S., W.S.P. 886.	6551-6556	XXXVII
197	Map showing Location of Irrigated Areas in Arkansas Basin of Colorado and Western Kansas.	6556-6557	XXXVII
198	Plate showing General Plan of Caddoa Dam and typical cross-sections of earth and concrete dam sections.	6578	XXXVII
199	Project Location Map. Shows Location of Caddoa Dam and Reservoir with respect to railroads, highways and towns in vicinity.	6580	XXXVII
200	Caddoa Reservoir Area and Capacity Curves. Graph showing areas and capacities for each foot of depth above bottom of sluice gates.	6582	XXXVII
201	Areas and Capacities — Caddoa Reservoir. Tabulation showing surface areas in acres, capacities in acre feet for each foot of depth above bottom of sluice gates.	6582	XXXVII

Exhibit No.		Page of Transcript	Volume of Transcript
201A	Arkansas River and Tributaries — House Document 308, 74th Congress, 1st Session — Volume I. Data relating to flood losses, p. 498, Table 53— first 3 columns under "Caddoa Reservoir Project."	6592	XXXVII
202	Map Showing Average Precipitation. 1908-1938. Average annual values shown in red figures for stations in or near Arkansas Basin of Colo. and Western Kansas.	6602	XXXVII
203	Map showing Average Temperature, 1908-1938. Average annual values shown in red figures for stations in or near Arkansas Basin of Colo. and Western Kansas	6603	XXXVII
204	Stream Flow Records for Period 1908-1938. Monthly, annual and seasonal flows for each year and average for the period shown for Arkansas River at Canon City, Pueblo, La Junta, Caddoa (calculated), Lamar, Stateline and Garden City (partially calculated) and for Purgatoire River near Las Animas.	6605	XXXVII
205	Map showing River Section Drainage Areas. Drainage areas above main river gaging stations shown by over-printed red lines. Total area includes Arkansas River from headwaters to Garden City, Kansas.	6607	XXXVII
206	Acres of Land Irrigated During 1908-1938—Arkansas Basin in Colorado and Kansas. Shows annual values from records of Colo. State Engineer and 1909, 1919, 1929 and 1939 values published by U. S. Census.	6622-6624	XXXVII

Exhibit No.		Page of Transcript	Volume of Transcript
207	Arkansas River at Caddoa, 1908-1938. Shows data and method used in calculating Caddoa flow, i.e., Arkansas River at La Junta plus Accretions La Junta to Caddoa minus Diversions La Junta to Caddoa—or Arkansas River at Lamar plus Diversions Caddoa to Lamar minus Accretions Caddoa to Lamar.	6633-6638	XXXVII
208	Hydrographs of Arkansas River at Colo.-Kans. State Line, 1908-1938. Shows mean daily values in second-feet.	6639	XXXVII
209	Arkansas River at Stateline and at Caddoa, 1908-1938. Shows monthly, annual and seasonal values for each year and averages for the period.	6640	XXXVII
210	Diversions and Accretions—Caddoa to Stateline, 1908-1938. Shows monthly, annual and seasonal values for each year and averages for the period	6644	XXXVII
211	Divertible and Undivertible Water in Arkansas River at Stateline, 1908-1938. Shows monthly, annual and seasonal values for each year and averages for the period. Based upon calculations that consider rates in excess of 2000 cfs. as undivertible.	6646-6647	XXXVII
212	Water Used by Kansas—Stateline to to Garden City and Arkansas River at Garden City, 1908-1938. Shows monthly, annual and seasonal values for each year and averages for the period	6651	XXXVII

Exhibit No.		Page of Transcript	Volume of Transcript
213	Calculated Diversions by Kansas Ditches—Stateline to Garden City, 1908-1938. Annual, summer and winter values for Syracuse and Garden City groups of ditches. Also the total of both groups and averages for the period	6653-6656	XXXVII
214	Hydrograph of Arkansas River at Stateline, 1908-1938. Shows monthly values in acre-feet and shows segregations of flow as follows:—Total Stateline Flow; Divertible Summer Flow; and Usable Summer Flow	6673	XXXVII
215	Segregation of Summer Flows Crossing Stateline compared with Kansas Diversion, 1908-1938. A seasonal hydrograph showing the following April-Sept. quantities: (1) Arkansas River at Stateline, (2) Divertible Flow (less than 2000 cfs.) at Stateline, (3) Usable Flow Available for Diversion in Kansas, (4) Kansas Diversions, and (5) Six-year progressive averages of Usable Water at Stateline and recorded Kansas diversions	6675	XXXVII
216	Percents of Silt in Suspension by Weight in the Arkansas River at Caddoa. Data from tests by U. S. Engineer Corps during 1938, 1939, 1940 and 1941	6682	XXXVIII
217	Estimated Siltation of Caddoa Reservoir in Percent of Monthly Inflow. Curve showing relation of siltation rate and monthly inflow quantities. Computed from tests shown in Colo. Ex. 216	6686	XXXVIII

Exhibit No.		Page of Transcript	Volume of Transcript
218	Estimated Monthly Silt Deposition and remaining Available Capacity in Conservation Pool of Caddoa Reservoir, 1908-1938. Computation based on assumption that Caddoa began operation as of 1908.....	6688	XXXVIII
219	Climatological Data and Evaporation Rates, Averages for 1908-1938 period. Shows monthly, annual, and seasonal values for temperature, wind velocity, relative humidity, gross evaporation, precipitation and net evaporation	6689, 6714, 6750	XXXVIII
220	Net Evaporation Loss—Caddoa Reservoir Operations Plan "F," 1908-1938. Shows monthly values for April to Sept., winter and annual values and averages for the period.	6694, 6714, 6750	XXXVIII
221	Available Water in Storage in Caddoa Reservoir at Close of Months March to Sept.—Operations Plan "F"—1908-1938. Shows quantities in storage in excess of 10,000 acre-feet recreation pool and indicates months when spills occurred..	6700, 6714, 6750	XXXVIII
222	Flood Pool Spills—Operations Plan "F"—1908-1938. Shows monthly, annual and seasonal spills from Caddoa under the operation plan...	6714, 6750	XXXVIII
223	Changes in Character and Amount of Stateline Flows—Operations Plan "F"—Averages for 1908-1938. A summary of historical conditions and of after-Caddoa conditions; indicates the amount of conservation benefit to each of the States.....	6728, 6750	XXXVIII

Exhibit No.		Page of Transcript	Volume of Transcript
224	Conservation Benefits to Kansas—Increased Usable Stateline Supplies of Summer Months, Plan "F"—1908-1938. Shows April-Sept. increases in usable supply by years and average for the period	6730, 6750	XXVIII
225	Stateline Flow Depletions—Operations Plan "F," 1908-1938. Shows increased irrigation depletions in Colo. and resultant Stateline flows for each year and average for the period	6734, 6750	XXVIII
226	Comparative Conservation Benefits—Operations Plan "F," 1908-38. Shows Kansas and Colorado benefits annually and by 10-year averages; also percent of 10-year progressive average benefit to each State	6736, 6750	XXXVIII
227	Increased Diversions in Colo.—Upstream and Downstream from Caddoa.—Operations Plan "F," 1908-1938. Shows annual, summer and winter changes in diversions by Colo. ditches under the operation plan. Diversion changes upstream, downstream and combined are shown separately	6744, 6750	XXXVIII
228	Diversions by Ditches in Colo. below Caddoa Res.—Operations Plan "F," 1908-1938. Monthly diversions April to Sept., total winter and total annual diversions are shown for each year. Also shown are the Short and Full schedules which were used in the Operation Plan	6745, 6750	XXXVIII

Exhibit No.		Page of Transcript	Volume of Transcript
229	Stateline Deliveries for Diversions in Kansas—Operations Plan "F," 1908-1938. Monthly deliveries April to Sept., total winter and total annual deliveries are shown for each year. Also shown are the Short and Full schedules used in the operation plan.	6746, 6750	XXXVIII
230 to 233 incl.	Arkansas River at Pueblo for Water Years 1937 and 1938. Two blueprint copies of Pueblo record for each year, showing (1) Arkansas River flow exclusive of all by-passed quantities and (2) Arkansas River flow plus diversions of Pueblo North Side Waterworks	6922	XXXVIII

INDEX OF DEFENDANTS (KANSAS) EXHIBITS

1	Climatological Data — Kansas Section, September 1929.	947	VI
2	List of ditch decrees in Irrigation Division No. 2—1930.	908	VI
3	List of reservoir decrees in Irrigation Division No. 2—1930.	908	VI
4	List of ditch structures in irrigation Division No. 2—1929, 1930. Compiled from reports of water commissioners. Shows whether ditches have headgates, flumes, gages or automatic recorders.	909	VI
5	Deposition of A. J. Abbott, case No. 6633, District Court. Finney County Water Users' Association vs. Graham Ditch Co. et al.	924	VII
6	Depositions of James Craig and David R. Menke, Case No. 6633, District Court.	1148	VIII

Exhibit No.		Page of Transcript	Volume of Transcript
7, 7a to 7s	Reported daily ditch diversions Canon City to Holly, Compiled by Geo. Knapp from Arkansas Valley Ditch Association Reports	1345	IX
8	Address by A. Watson McHendrie as President of Colo. Bar Association given at 33rd annual meeting of Association, Sept. 19-20, 1930.	1389	IX
9	Address of M. C. Hinderlider at 4th annual conference of Western State Engineers, Sacramento, California, Oct. 28-30, 1931.	1389	IX
10	Tabulation of monthly distribution of precipitation along Arkansas River in Colorado, Canon City to Colo.-Kans. line. Compiled by R. I. Meeker from records of U. S. Weather Bureau....	1413	IX
11	Tabulation of monthly distribution of precipitation along Arkansas River in Kansas, State Line to Garden City. Compiled by R. I. Meeker from records of U. S. Weather Bureau...	1414	IX
12	Comparison of average monthly distribution of rainfall, Arkansas River Valley in eastern Colorado and western Kansas, between 5 stations in Colorado, as shown by Exhibit 10, and 5 stations in Kansas, as shown by Exhibit 11.	1414	IX
13	Arkansas River at Canon City, Daily flows, 1888-1930. Records of U.S.G.S. and Colorado State Engineer.	1434	IX

Exhibit No.		Page of Transcript	Volume of Transcript
14	Arkansas River at Pueblo. Daily flows, 1885-1887, 1895-1930. Records of U.S.G.S. and Colorado State Engineer.	1435	IX
15	Arkansas River at La Junta. Daily flows, 1903, 1912-30. Records of U.S. G.S. and Colorado State Engineer...	1436	IX
16	Arkansas River at Lamar. Daily flows, 1913-30. Records of Colorado State Engineer.	1438	IX
17	Arkansas River at Holly. Daily flows, 1907-30. Wild Horse Creek at Holly. Daily Flows 1923-30. Holly Drain, daily flows 1924-30. Records of U. S. G. S. and Colorado State Engineer ...	1440	IX
18	Arkansas River at Canon City. Monthly and annual recorded and estimated flow 1888-1930. Compiled by R. I. Meeker	1442	IX
19	Monthly ditch and pipe line diversions around Canon City gaging station, 1888-1930. Compiled by R. I. Meeker from records of State Engineer's Office and daily reports of Arkansas Valley Ditch Asociation...	1446	IX
20	Annual ditch and pipe line diversions around Canon City gaging station, 1888-1930. Compiled by R. I. Meeker from records of State Engineer's Office.	1447	IX
21	Daily trans-mountain diversions from Colorado River basin to Arkansas River basin, Colorado, 1925-30. Compiled by R. I. Meeker from official records of State of Colorado on file at office of Division Engineer at Pueblo.	1451	IX

Exhibit No.		Page of Transcript	Volume of Transcript
22	Daily gage heights and storage quantities of principal mountain reservoirs above Canon City in Arkansas River basin, 1906-30. Compiled under direction of George Knapp from daily reports of Arkansas Valley Ditch Association	1457	IX
23	Annual reservoir carryover and reservoir depletion of mountain storage reservoirs above Canon City in Arkansas River basin. Compiled by R. I. Meeker from records of Colorado State Engineer.	1459	IX
24	Computed water consumption by irrigated lands above Canon City in Arkansas River basin. Compiled by R. I. Meeker from records of State of Colorado and U.S. Census.	1462	IX
25	Arkansas River at Canon City. Annual flow 1888-1930. Recorded flow corrected for transmountain water, reservoir carry-over and reservoir depletion, and ditch and pipeline diversions around station. Compiled by R. I. Meeker from Records of State of Colorado and other sources.	1468	IX
26	Monthly and annual flow Purgatoire River at Trinidad 1897-99, 1905-30. Compiled by R. I. Meeker from records of U. S. G. S. and Colorado State Engineer	1470	IX
27	Monthly and annual flow Cucharas River at La Veta, and Huerfano River at Manzanares Crossing, 1923-1930. Compiled by R. I. Meeker	1472	IX

Exhibit No.		Page of Transcript	Volume of Transcript
28	Monthly and annual flow Fountain River at Colorado Springs, 1922-24, and St. Charles River at Burnt Mill Crossing, 1923-30. Compiled by R. I. Meeker	1473	IX
29	Monthly and annual flow West Beaver Creek near Victor, 1905-27. Compiled by R. I. Meeker from private records Skagway Power Company on file in Colo. State Engineer's Office	1475	IX
30	Average yearly flows of mountain water supply: Arkansas at Canon City, Purgatoire at Trinidad, Huerfano at Manzanaras Crossing, Cucharas at La Veta, Fountain at Colorado Springs, St. Charles at Burnt Mill, West Beaver Cr. near Victor, Apishapa at Aguilar, Four Mile Cr., Hardscrabble Cr., East Beaver Cr., Turkey Cr. and Miscellaneous tributaries	1479	IX
31	Total inflow to Arkansas River, Canon City to Holly, 1912-30. From all sources: Surface flow, return flow and deep percolation from rainfall. Compiled from analytical study by R. I. Meeker	1483	IX
32	Return flow, Arkansas River, Canon City to Holly, 1912-30. Compiled by R. I. Meeker	1485	IX
33	Tributary inflow to Arkansas River, Canon City to Holly, 1912-30, from all sources: Surface Stream flow, return flow from irrigated lands, and deep percolation from rainfall. Compiled from analytical study by R. I. Meeker	1488	IX

Exhibit No.		Page of Transcript	Volume of Transcript
34	Mountain and plains run off Arkansas River basin in Colorado, Canon City to Holly, 1912-30. Compiled by R. I. Meeker	1489	IX
35	Average yearly water supply, Arkansas River basin in Colorado. Compiled by R. I. Meeker	1490	IX
36	Monthly and annual flow of Arkansas River at Colorado and Kansas canal diversion dam near Prowers for 1901. Compiled by R. I. Meeker from U. S. G. S. Water Supply Paper No. 75, page 147	1492	IX
37	Monthly and annual flow of Arkansas River at Syracuse, Kansas, 1902-03, 1905. Compiled by R. I. Meeker from records of U.S.G.S., Kansas Water Commission Report, 1900, page 289, and U.S.G.S. Water Supply Paper No. 99	1493	IX
38	Monthly and annual flow of Arkansas River at Amity Dam, 1906-07. Compiled by R. I. Meeker from biennial reports of Colorado State Engineer.	1493	IX
39	Monthly and annual flow of Arkansas River at Syracuse, 1921-30. Compiled by R. I. Meeker from report of State Irrigation Commissioner of Kansas and report of Division of Water Resources, Kansas State Board of Agriculture.	1494	IX
40	Monthly and annual flow of Arkansas River at Hutchinson, Kansas, 1895-1905. Compiled by R. I. Meeker from records of U.S.G.S. records and Kansas Water Commissioner, 1920.	1494	IX

Exhibit No.		Page of Transcript	Volume of Transcript
41	Monthly and annual flow of Arkansas River at Larned, Kansas, 1923-30. Compiled by R. I. Meeker from records of State of Kansas.	1496	IX
42	Monthly and annual flow of Pawnee Creek at Larned, Kansas, 1925-30. Compiled by R. I. Meeker from records of State of Kansas.	1497	IX
43	Annual flow of Arkansas River at Hutchinson, 1923-30. Derived by R. I. Meeker from records at Larned plus Pawnee Cr. plus estimated inflow from Walnut and Rattlesnake Creeks.	1498	IX
44	Comparison of flow by years of Arkansas River at Syracuse and Hutchinson, 1923-30. Compiled by R. I. Meeker.	1498	IX
45	Relation curve "A", between Arkansas River at Syracuse and at Hutchinson, 1901-1903, 1905, 1923-30. Graph. Used to supply missing years at Syracuse, 1895-1904. By R. I. Meeker.	1500	IX
46	Relation curve "B", between Arkansas River at Syracuse and at Holly, 1923-30. Graph, by R. I. Meeker.	1501	IX
47	Arkansas River at Holly, 1895-1900, 1902, 1904. Deduced by R. I Meeker from Tables 20 to 28 incl. and Curves "A" and "B".	1503	IX
48	Monthly and annual total flow, Arkansas River at Holly, Wild Horse Creek and Holly Drain, 1922 to 1930. Compiled by R. I. Meeker from records of State of Colorado.	1503	IX

Exhibit No.		Page of Transcript	Volume of Transcript
49	Monthly and annual flow, Arkansas River at Holly, 1895-1930. Compiled by R. I. Meeker from records of State of Colorado, U. S. G. S. and other sources	1504	IX
50	Arkansas River basin outflow at Holly, 1895-1930. Compiled by R. I. Meeker from all available sources	1504	IX
51	Irrigated lands, Arkansas River basin in Colorado, 1860-1930. Compiled by R. I. Meeker from Administrative records of State of Colorado, U. S. Census reports and other sources	1507	IX
52	Irrigated lands by counties, Arkansas River basin in Colorado. Compiled by R. I. Meeker from U. S. Census reports	1507	IX
53	Irrigated lands in Water Districts 14, 17 and 67 in main Arkansas Valley, supplied with water from tributaries, 1912-30. Compiled by R. I. Meeker	1508	IX
54	Irrigated lands in main Arkansas Valley, Canon City to Holly, 1912-1930, with lands irrigated from side streams excluded. Compiled by R. I. Meeker	1509	IX
55	Annual total water supply, return flow, net river flow, Holly outflow and consumptive use, Arkansas River valley, Canon City to Holly, 1912-30. Compiled by R. I. Meeker	1510	IX
56	Consumptive use of water, Main Arkansas valley, Canon City to Holly, 1912-30. Compiled by R. I. Meeker.	1513	IX

Exhibit No.		Page of Transcript	Volume of Transcript
57	Irrigated areas watered from side streams tributary to Arkansas River below Canon City, 1912-30. Compiled by R. I. Meeker from Water Commissioner's records	1513	IX
58	Irrigated lands and consumptive use of water, side streams tributary to Arkansas River, Canon City to Holly, 1912-30. Compiled by R. I. Meeker	1516	IX
59	Water consumption, Arkansas basin in Colorado—main Arkansas Valley, mountain valleys above Canon City and side streams below Canon City, 1912-30. By R. I. Meeker	1516	IX
60	Irrigated lands and water consumption by years, Arkansas basin in Colorado, 1912-30. Corrected for reservoir storage and release, Mountain reservoirs above Canon City and transmountain water. By R. I. Meeker	1517	IX
61	Yearly water consumption, irrigated lands in Arkansas basin in Colorado, 1895-1930. By R. I. Meeker	1518	IX
62	Reconstructed water supply, Arkansas basin in Colorado, 1895-1930. Deduced and computed from records of State of Colorado, U.S.G.S. and State of Kansas by R. I. Meeker, Holly outflow + Colorado water consumption =Total Water Supply	1519	IX
63	Comparative table, Arkansas basin water supply produced by Colorado, 1895-1930. By R. I. Meeker	1522	IX

Exhibit No.		Page of Transcript	Volume of Transcript
64	Reservoir capacity available for storage prior and subsequent to 1905 in principal reservoirs, Arkansas River basin in Colorado. Compiled by R. I. Meeker from records of State Engineer's Office and other sorces...	1542	IX
65	Comparative table, major reservoirs, Arkansas River basin in Colorado. Shows date of decree and date of approval by State Engineer. Compiled by R. I. Meeker from records of State Engineer's office in Denver....	1543	IX
66	Monthly storage quantities in principal reservoirs, Arkansas River basin in Colorado, Nov. 1925 to Dec. 1931. Copies of records of Division Engineer Irr. Div. No. 2.....	1549	IX
67	Graph showing irrigated land, 1860-1930, water consumption, 1880-1930 and capacity of principal reservoirs, 1895-1930, in Arkansas River basin in Colorado. By R. I. Meeker.....	1556	X
68	Progressive table of water consumption by irrigated lands in Colorado portion of Arkansas River basin, 1860-1930. By R. I. Meeker.....	1567	X
69	Comparative table showing relation of irrigated lands and capacity of principal reservoirs to water consumption in Colorado, Arkansas River basin. By R. I. Meeker from Kansas Exhibit 67.....	1568	X
70	Graphs "A" and "B" showing Arkansas River reconstructed water		

Exhibit No.		Page of Transcript	Volume of Transcript
	supply, water consumption in Colorado; river outflow at Holly, and water divertible by Kansas canals, 1895-1931. By R. I. Meeker	1569	X
71	Hydrograph showing precipitation, Arkansas River at Canon City, reported tributary inflow, unmeasured water supply, Arkansas River at Holly and ditch diversions Canon City to Holly for year 1912. By R. I. Meeker	1618	IX
72-90 inc.	Hydrographs, 1913-1931, showing same information as above for each year	1618-1684	X
91	Daily discharge of Arkansas River for year 1931, at Canon City, Pueblo, La Junta, Lamar and Holly. Also Wild Horse Cr. at Holly, Holly Drain, Purgatoire at Trinidad, Cucharas near La Veta, Huerfano at Manzanares and St. Charles at Burnt Mill for 1931	1681	X
92	Tabulation of major decrees, Arkansas River in Colorado, in Water Districts 14, 17 and 67	1694	X
93	Graph showing seasonal rainfall and water requirement Canon City to Hutchinson. By R. I. Meeker	1725	X
94	Average yearly headgate duty of water, nine major canals, Arkansas Valley, 1920-31. Compiled by R. I. Meeker from daily reports of Arkansas Valley Ditch Association	1727	X

Exhibit No.		Page of Transcript	Volume of Transcript
95	Yearly headgate diversions of Rocky Ford and Catlin Canals, 1920-31. From Water Commissioners' reports and daily reports of Arkansas Valley Ditch Association	1727	X
96	Yearly ditch and canal diversions from Arkansas River, Canon City to Holly, 1912-30. By R. I. Meeker from analytical studies of river flow	1744	X
97	Kansas State-line water schedule "A." Based on equitable apportionment of one-half the total supply. Prepared by R. I. Meeker	1746	X
98	Kansas State-line water schedule "B." Based on division of dependable flow. Prepared by R. I. Meeker.	1748	X
99	Kansas State-line water schedule "C." Based on increased water consumption since 1905 and water saving, Canon City to Holly. Prepared by R. I. Meeker	1750	X
100	Crop producing power of 30 acre inches of water when applied to different areas of land	2208	XIII
101	Mechanical analysis of soils in eastern Colorado and Western Kansas. From U. S. Bureau of Soils	2294	XIII
102	Map of Arkansas River basin in Colorado and Kansas showing groups of counties compared Colorado to Kansas as to crop yields, crop values and assessed valuations	2294	XIII
103	Ten years summary of annual acreage and percentage of principal crops in certain counties in Kansas, 1921-30.	2295	XIII

Exhibit No.		Page of Transcript	Volume of Transcript
104	Ten year summary of annual acreage and percentage of principal crops in certain counties in Colorado, 1921-30.	2295	XIII
105	Area, land classification and acreage in crops of certain Colorado counties, 1921-22, 1925-29	2304	XIII
106	Comparison of yields of most of the principal crops in certain counties in Colorado and Kansas, 1921-30	2309	XIII
107	Acreage and yields of irrigated and non-irrigated crops of winter wheat, corn, oats and barley in the river tier of counties in Colorado, 1921-30	2325	XIII
108	Comparison of values per acre of all crops in certain counties in Colorado and Kansas, 1921-30	2325	XIII
109	Dry land acreage and yields of winter wheat, corn, oats and barley in certain counties of Colorado, 1921-30	2330	XIII
110	Map of Arkansas River Basin in western Kansas, showing lands irrigated in 1931, abandoned projects and irrigable lands	2335	XIV
111	Acreage of winter wheat, percentage of acres abandoned, yields based on acres harvested, and the value per acre of certain counties in Kansas, 1921-30	2342	XIV
112	Acres, yield per acre and value of alfalfa in certain counties in Kansas, 1921-30	2346	XIV
113	Acres, yield per acre and value of sugar beets in certain counties in Kansas, 1921-30	2346	XIV

Exhibit No.		Page of Transcript	Volume of Transcript
114	Maximum daily amount in cubic feet per second diverted by the Kansas ditches each year, 1921-30.....	2354	XIV
115	Irrigated acreage as reported in Kansas counties, 1895-1930.....	2355	XIV
116	Relationship between rainfall and resulting runoff. Entire Kansas River basin above Topeka.....	2399	XIV
117	Relationship between rainfall and resulting runoff. Entire Marais des Cygnes River basin above Ottawa...	2402	XIV
118	Water supply from tributaries at head of area irrigated from Arkansas River.....	5071	XXIX
119	Map showing distribution in acre feet per square mile of Amsley's tributary water supply Pueblo to Holly, 1922..	5072	XXIX
120	Water supply from tributaries at head of area irrigated from Arkansas River. From Amsley report of 1923.	5091	XXIX
121	Map showing distribution in acre feet per square mile of Amsley's tributary water supply Pueblo to Holly, 1923..	5093	XXIX
122	Water supply from tributaries at head of area irrigated from Arkansas River. From Amsley report of 1924..	5102	XXIX
123	Map showing distribution in acre-feet per square mile of Amsley's tributary water supply Pueblo to Holly, 1924.....	5103	XXIX
124	Water supply from tributaries at head of area irrigated from Arkansas River. From Amsley report of 1925.	5108	XXIX

Exhibit No.		Page of Transcript	Volume of Transcript
125	Map showing distribution in acre-feet per square mile of Amsley's tributary water supply Pueblo to Holly, 1925	5109	XXIX
126	Map showing distribution in acre-feet per square mile of Amsley's tributary water supply, Pueblo to Holly, 1922-1925	5113	XXIX
127	Map showig distribution in acre-feet per square mile of Tipton's water supply Pueblo to Holly 1922-32. Computed from Colo. Exhibit 118 and public records	5134	XXIX
128	Chart showing six-year averages of annual flow of Arkansas River at Canan City and Holly, 1888-1932. (Another chart is attached showing same information 1888-1935)	6042	XXXIV
129	December, 1933 Stipulation as to Caddoa reservoir. (Same as Colorado Exhibit 179.)	6053	XXXIV
130	Average monthly and annual precipitation in inches at Arkansas River basin stations in Colorado and western Kansas. Comparison of record to 1930 with averages 1931-41, and entire station record including 1941. Six stations added to list appearing in Colo. Exhibit 190	6951	XXXIX
131	Analysis of increased benefits to Kansas and Colorado under Colorado's plan F, by a comparison of Colorado Exhibits 229 and 212; the result being compared with Colorado Exhibit 227	6982	XXXIX

Exhibit No.		Page of Transcript	Volume of Transcript
132	Comparison of summer increased diversions up-stream prior to reservoir depletion, with proposed deliveries to Kansas for balance of summer years when Caddoa reservoir would be emptied under Plan F. From Colorado Exhibits 221, 227 and 229.....	6987	XXXIX
133	Relation of water diverted in Colorado in Arkansas River basin, together with proposed increased diversions in Colorado to proposed allocations to Kansas under Colorado Plan F. Diversions are from Colo. State Engineer reports, and proposed increased diversions and state line deliveries from Colorado Exhibits 227 and 229.....	7000-01	XXXIX
134	Suggested permanent method of division of water of Arkansas River, *i. e.*, 50% of total of corrected Arkansas at Canon City, plus Purgatoire at mouth, 1908-38.....	7019-23	XXXIX
135	Annual flow of Arkansas River at Canon City, 1908--1938, corrected for diversions around gage and transmountain water.....	7024-25	XXXIX

LIST OF TABLES INCLUDED IN APPENDIX "A".

Table		Page
1	Precipitation Stations Along Arkansas River in Colorado and Western Kansas.	56
2	Discharge of Arkansas River at Principal Stream Gaging Stations. Averages for Period 1909-1938...	59
3	Arkansas River at Canon City: 1908-1938. Station Records Adjusted by Allowances, for By-Passed and Imported Quantities of Water.	61
3-a	Direct Flow Water Rights in Arkansas River in Colorado by Water Districts.	67
3-b	Calculated Consumptive Use for the Main River Section, Canon City to Stateline	77
3-c	Calculated Unit Rates of Consumptive Use in Colorado.	78
3-d	Average Storage Captured by Great Plains Reservoirs.	79
3-e	Rate of Diversion per Acre from Arkansas River by the Amity Canal.	79
4	Average Annual Diversions from Arkansas River by Ditches in Colorado, Canon City to Stateline....	81
5	Average Annual Diversions, Returns and Depletions, Arkansas River, Pueblo to Stateline.....	82
5-a	Relations Between Index Flows and Kansas Diversions.	88
6	Comparison of Irrigation in Kansas and in Colorado. (From 1930 Census).	90
7	Irrigated Acreages in Arkansas River Basin in Colorado and Kansas.	90
8	Irrigated Acreages in Arkansas River Basin in Colorado as Reported by District Water Commissioners.	91

Table		Page
9	Interstate Relations per Irrigated Acreages (Computed).	92
10	Acres of Field Crops Harvested in Kansas by Divisions.	92
11	Average Annual Values o Agricultuıal Products in Kansas.	93
12	Values of Field Crops in Kansas by Divisions.	93
13	Acres of Field Crops in Central Kansas.	94
14	Values of Field Crops in Central Kansas by County Groups.	94
15	Summarized Per Acre Values of Field Crops in Central Kansas.	95
16	Acres of Field Crops in Western Kansas.	96
17	Values of Field Crops in Western Kansas.	97
18	Annual Values Per Acre of Field Crops in Western Kansas.	98
19	Total Field Crops and Irrigated Acreages, Counties of Western Kansas on Arkansas River.	99
20	Populations of Counties along Arkansas River in Colorado and in Kansas.	100
21	Populations State of Kansas by Divisions.	101
22	Populations of Counties of Western Kansas.	102
23	Populations Central Division State of Kansas.	102
24	Population of Finney County, Kansas.	103
25	Flow of Arkansas River Across the Stateline from Colorado into Kansas. Period 1908-1938.	118
26	Divertible Stateline Flows. Period 1908-1938.	119
27	Range in Daily Flows of Arkansas River at Canon City, Colorado.	123

Table		Page
28	Average Discharge of Arkansas River at Canon City by months, Period 1908-1938.	124
29	Number of Days in Summer Season Flow Of Arkansas River at Canon City exceeded specified rates.	125
30	Diversions from Arkansas River by Ditches in Hamilton, Kearney and Finney Counties, Kansas.	127
31	Adjudicated Direct Flow Water Rights Arkansas River and Tributaries in Colorado with Priority Dates Senior to 1880.	131
32	Average Discharge of Arkansas River at Caddoa and at Stateline, Diversions and Accretions along River Section.	147
33	Diverfible and Undivertible Stateline Flows, Quantities Used and Unused in Kansas.	148

ANALYSIS OF EVIDENCE AS RELATED TO SPECIAL MASTER'S REPORT

WATER SUPPLY

The headwater sources of the Arkansas River are in the Rocky Mountains of Central Colorado, from whence it flows eastward across the Great Plains of Eastern Colorado and Western Kansas, and, in Central Kansas, turns southward to leave that state at its southern boundary.

It has a length in Colorado of 320 miles, exclusive of tributaries, and crosses, in downstream order, the counties of Lake, Chaffee, Fremont, Pueblo, Crowley, Otero, Bent and Prowers (Colorado Exhibit 30, vol. III, p. 410; App. "B," p. 1). In Kansas its length is 390 miles, and crosses the counties of Hamilton, Kearney, Finney, Gray, Ford, Edwards, Pawnee, Barton, Rice, Reno, Sedgwick, Sumner and Cowley (Colorado Exhibit 31, Tr. vol. III, p. 411; App. "B," p. 2).

Total land areas in the basin in the two states aggregate 46,823 square-miles, of which 24,628 square-miles are in Colorado (Colorado Exhibit 205, Tr. vol. XXXVII, p. 6607; App. "B," p. 59), and 22,195 square miles are in Kansas (Colorado Exhibit 31, Tr. vol. III, p. 411; App. "B," p. 2). The 22,195 square-miles of tributary area in Kansas includes 1,200 square-miles at the headwaters of Bear Creek and White Woman Creek in Colorado, the runoff from which flows from Colorado into Kansas in channels other than the Arkansas River. Bear and White Woman creeks are independent stream systems the flows of which disappear in Kansas and have no direct surface connections with the Arkansas or other principal rivers.

The above described drainage area of the Arkansas River basin is exclusive of areas in Colorado and Kansas drained by the Cimarron River, a tributary entering the Arkansas River in Oklahoma; and the drainage area in Kansas is exclusive of lands in that state drained by the Verdigris River and the Neosho-Grand River, both of which

have their sources in Eastern Kansas, but join the Arkansas River in Oklahoma.

The Arkansas River is formed by the junction of branches known as East Fork and Tennessee Fork with Lake Fork, at a point near Leadville, in Lake County, Colorado, where the elevation approximates 10,000 feet. These headwater branches extend up to elevations of 10,500 to 12,000 feet at mountain passes across the Continental Divide, and up to more than 14,000 feet at the crests of highest mountain peaks. (Tr. p. 347, vol. III.) Thence for a distance of about 130 miles the river is a typical mountain torrent, descending rapidly, with a gradient of 40 feet per mile, down to elevation 5,363 feet at Canon City (Tr. p. 505, Vol. IV), where it emerges from the mountains via the Royal Gorge. Thence across a foothill region to Pueblo and across the High Plains of Eastern Colorado, it descends, with a gradient averaging 10 feet per mile, to elevation 3,345 feet at the Stateline between Colorado and Kansas (Tr. p. 506, Vol. IV). Across Kansas the river channel descends, with a gradient averaging 6 feet per mile, to elevation 1,000 feet at the southern boundary of that state (Tr. p. 506, Vol. IV).

The climatic conditions are widely different in various subdivisions of the basin.

In the mountainous headwater regions, local topography and altitude affect the amount and character of natural precipitation, causing wide differences often within distances of relatively few miles. Here the annual precipitation is least in sheltered valleys, where averages range downward to 10 inches or less, and is greatest at the crests of mountain ranges and peaks, where averages range upward to 20 or 30 inches or more, much of which is in the form of snow (Colorado Exhibit 202, Tr. vol. XXXVII, p. 6602; App. "B," p. 52). The limited mountain areas receiving such higher amounts of precipitation are themselves too high and cold, and generally too steep, rocky and rough to be valuable for agricultural purposes other than grazing of livestock during mid-summer months. The

melting snows from such areas during periods of a few weeks in late-spring or early-summer months, however, constitute the sources of perennial stream flows. These snow-melt periods, and the runoff and stream flows resulting therefrom, are frequently referred to as the "June-rise."

To the east of the Rocky Mountains across the Great Plains region, differences in local topography are minor in their extent and unimportant in their effects in causing material variations in rates of natural precipitation which principally, is rainfall rather than snow, and to a large extent occurs in the form of occasional intense down-pours often termed cloudbursts. Over this plains region there is a definite trend of increasing amounts of precipitation to the east. The following Table 1, compiled from Colorado Exhibit 202 (Tr. vol. XXXVII, p. 6602; App. "B," p. 52), shows the amounts of precipitation recorded by the United States Weather Bureau in the average year of the period 1908 to 1938 inclusive, at stations in Colorado and Western Kansas listed in the order of their relative locations along the Arkansas River.

Table 1

Precipitation at Stations along Arkansas River In Colorado and Western Kansas

Values in Inches Annually — Averages 1908-1938

Station	Inches
Buena Vista	10.28
Salida	12.20
Canon City	12.87
Penrose	11.88
Pueblo	11.37
Ordway	11.05
Rocky Ford	11.24
La Junta	13.35
Las Animas	12.61
Lamar	14.77
Holly	14.33
Average of 11 Colorado Stations	12.31
Syracuse	17.12
Lakin	14.62
Garden City	18.27
Cimarron	19.19
Dodge City	19.00
Average of 5 Western Kansas Stations	17.64

From Colorado Exhibits 15 and 16 (Vol. 1, pp. 57, 58) it appears that normal precipitation up to 1929, averaged annually:

at Larned (Pawnee County, Kansas)....22.81 inches
at Hutchinson (Reno County, Kansas)...27.46 inches
at Wichita (Sedgwick County, Kansas)..30.66 inches

and at stations in the areas of the Verdigris and Neosho-Grand rivers in Eastern Kansas, but tributary to the Arkansas river, the average ranged from 32 to 40 inches annually.

Precipitation is the one original source of the stream flows and water supplies of the interstate stream; and inadequacy of natural precipitation creates the necessity for irrigation of lands and artificial applications of moisture to soils and crops in the aid of agriculture.

In the eastern Colorado portion of the Arkansas River basin, natural precipitation is least, climatic conditions are most arid, the need for irrigation is greatest, and yet the supplies of water locally produced by precipitation are least. (Tr. pp. 414, 473, Vol. III.) Here, the function of irrigation is truly one of reclamation. Irrigation is *necessary* for the successful production of agricultural crops and for the permanent occupation of the region. Established civilizations are and must remain largely if not unalterably dependent on continuing the practices of irrigation and of the diversion and use of water, without which the lands, under prevailing climatic conditions, would revert to unproductive and unoccupied desert lands.

Eastward, with increasing amounts of natural precipitation, there is relatively less need for irrigation and relatively less dependence on the practice. In Central Kansas irrigation is neither generally practiced nor an important feature of agricultural operations. Its limited extent and more or less complete absence is not, however, due to a lack of locally available supplies of water, but rather is attributable to lack of need for irrigation. Local rainfall is relatively large in amount, producing abundant water supplies, but at the same time satisfying directly the requirements of agriculture for moisture without the aid of irrigation. Such artificial watering of lands and crops as may be practiced under humid climatic conditions serves the function, not of reclamation but of a form of insurance against occasional drouths, or to increase yields and profits from lands already occupied, relatively valuable, and generally productive without the aid of irrigation.

Western Kansas, where climatic conditions are intermediate between the relatively arid climate of Eastern Colorado and the relatively humid climate of Central Kan-

sas (Tr. p. 414, Vol. III), is a zone or belt of country in which the success of agriculture without irrigation fluctuates with climatic cycles. In some years and cycles when drouth conditions are severe this intermediate zone experiences climatic conditions such as commonly prevail in Eastern Colorado, while in more favorable cycles the climate more nearly resembles that of Central Kansas. Colorado Exhibits 14-20 (Tr. pp. 57-99, Vol. I). Colorado Exhibits 38 and 41 (Tr. 563, 570, Vol. IV). Colorado Exhibit 490 (Tr. p. 6485 Vol. XXXVII.)

All ditches in the State of Kansas that divert water from the channel of the Arkansas River for irrigation purposes are located in Hamilton, Kearney and Finney counties, in the extreme western portion of Western Kansas, between the Colorado line and Garden City in Finney County (Tr. p. 6653, Vol. XXXVII). In this territory the rainfall at stations along the Arkansas River averages 15 to 18 inches annually.

Some irrigation is practiced further eastward in Kansas, as in the vicinities of Dodge City and Larned, the water supplies for which are derived from ground waters or from the flows of tributary streams arising in Kansas, but not from the Arkansas River, (Tr. pp. 3544-3546, Vol. XXI).

The quantities of water flowing in the Arkansas River at various stations have been measured and recorded for periods, at some stations in Colorado, of more than 50 years, and at other points for shorter periods. For purposes of comparing the stream flows at one point with those at other points, it is essential, to avoid distortions caused by variations in climatic conditions, that the same period of years be employed at all stations. In the following Table 2, the recorded flow at principal stations and points along the Arkansas River have been averaged over the 31-year period 1908 to 1938. The period beginning with 1908 was selected because the original case of *Kansas v. Colorado* was decided in 1907, and records disclosing the stream flows crossing the Stateline from Colorado into

Kansas began to be compiled in October 1907 with the establishment of a stream-gaging station by Colorado at Holly, near the Stateline. Table 2 summarizes information regarding drainage areas upstream, and concerning annual flows in the average year of the 1908-1938 period, expressed in acre-feet and equivalent rates in cubic feet per second, of the Arkansas River at principal stations and points.

Table 2

Discharge of Arkansas River
At Principal Stream-Gaging Stations
(Averages for Period 1908-1938)

Name of Station Point on Stream	Upstream Area (Sq. Mi.) (a)	Average Discharge A.F./Yr. (b)	C.F.S.*
Canon City, Colo.	3,090	519,767	719
(Adjusted)	3,090	573,964(c)	794
Pueblo, Colo.	4,730	502,764	695
La Junta, Colo.	11,470	189,180	262
(Purgatoire River)	(3,320)	(96,416)	(133)
Caddoa Dam	18,180	295,710	409
Lamar, Colo.	18,838	193,640	268
Stateline (Colo.-Kans.)	24,628	260,742(d)	361
Garden City, Kans.	29,893	171,050(e)	237
Stateline (Kans.-Okla.)	46,823	1,460,000(f)	2,019

(a) Drainage areas from Colo. Ex. 205 (App. "B," p. 59) and Colo. Ex. 30, 31 (App. "B," p. 1, 2) (corrected).
(b) All discharges from Colo. Ex. 204 (App. "B," p. 54-58) except as otherwise noted.
(c) From Kans. Exh. 134; (App. "B," p. 73) records adjusted to allow for by-passed quantities and imported waters.
(d) Station established Oct. 1907; after 1923 includes also waters delivered via Holly drain.
(e) Station below all ditches in Kansas diverting from Arkansas River for irrigation purposes.
(f) Adjusted to 1908-1938 average from value 1,703,144 A. F. representing average for 1922-1931 (Tr. p. 5759, vol. XXXII); does not include about 4,000,000 A. F. annually produced in Kansas which flows via Verdigris and Neosho-Grand rivers from Kansas to Oklahoma and there into Arkansas River.

*One cubic foot per second running continuously for one year equals 723 Acre Feet, (Approximately 1 c.f.s. for 24 hrs. equals 2 acre-feet).

Runoff from the mountainous areas upstream from Canon City, each year of the period from 1908 to 1938, is shown in the following Table 3. Recorded flows at Canon City have been adjusted by allowances, as made in Kansas Exhibit 135 Tr. (vol. XXXIX, p. 7024; App. "B," p. 74), for quantities of water by-passed around the Canon City station by ditches diverting above, and for quantities imported to the Arkansas River from adjoining stream systems.

Table 3

Arkansas River at Canon City: 1908-1938
Station Records Adjusted by Allowances for
By-passed and Imported Quantities of Water

			Six-Year Period Averages	
	Acre-Feet	% Avge.	Acre-Feet	% Avge.
1908	396,271	69.0		
09	701,970	122.3		
1910	567,408	98.9		
11	701,618	122.2		
12	671,535	117.0		
13	485,752	84.6	587,430	102.3
14	721,900	125.8	641,700	111.8
1915	546,000	95.1	615,700	107.3
16	685,620	119.5	635,400	110.7
17	670,580	116.8	630,230	109.8
18	636,920	111.0	624,450	108.8
19	639,250	111.4	650,040	113.3
1920	688,640	120.0	644,500	112.3
21	717,850	125.1	673,140	117.3
22	560,310	97.6	652,260	113.6
23	701,890	122.3	657,480	114.6
24	671,000	116.9	663,160	115.5
1925	427,900	74.6	627,930	109.4
26	547,540	95.4	604,420	105.3
27	600,700	104.7	584,890	101.9
28	569,430	99.2	586,410	102.2
29	628,420	109.5	574,160	100.0
1930	521,200	90.8	549,200	95.7
31	342,349	59.6	534,940	93.2
32	518,097	90.3	530,030	92.3
33	448,698	78.2	504,700	87.9
34	310,238	54.1	461,500	80.4
1935	515,306	89.8	442,650	77.1
36	627,419	109.3	460,350	80.2
37	416,220	72.5	472,660	82.4
38	554,850	96.7	478,790	83.4
AVGE.	573,964	100.0		

Stream flows in above-average amounts occurred in 15 of the 31 years of the period, and of these there were six years during which the quantities were 20 percent or more above average. Greatest discharge in any one year exceeded the average by 26 percent. Considered by periods of six consecutive years, the largest outflows from mountainous areas, recorded during 1916 to 1921, were 17 percent above the period average.

Consulting the columns of Table 3 relative to six-year period averages during each of the said periods, beginning with the one of 1908 to 1913, to and including the one of 1924 to 1929, the mountain runoff was equal to or in excess of the long-time average quantity; and thereafter, that all six year periods were sub-normal. Compared with the average of 611,000 acre-feet per year that prevailed during 1908 to 1930, the average declined to 466,000 acre-feet per year during 1931 to 1938.

After its emergence from the mountains, the Arkansas River follows a channel several hundred miles in length across the Great Plains. Its channel is a broad and widening expanse of sand, meandering over a flood plain of even greater width, underlain with sands and gravels of considerable depth and great powers of absorption. Tributaries that traverse the Great Plains have similar, though smaller, stream channels, adjoining bottom lands and underflow conduits. Floods of major magnitude and intensity such as periodically originate in foothills and plains areas, in first one and then another of the tributaries, are absorbed and diminished in volume as they move downstream. Moderate floods often are lost or disappear in relatively short distances. Perennial stream flows that originate in high mountains of tributary headwaters, upon arrival at foothill and plains sections, decrease in volume and at times disappear altogether. Perennial flows in the main stream, after their emergence from the mountains, are similarly decreased in amount and, at times, disappear. (Tr. pp. 3361-3362, Vol. XX) (Master's Report, pp.3-8.)

Such declines in stream flow volumes and disappearances of rivers are the result not only of variability of precipitation but of natural conveyance losses and of evaporation, — a natural process by which water is converted to vapor and returned to the atmosphere. Water is evaporated directly from exposed surfaces of streams. It is evaporated from the surfaces of sand beds in and along the river channels, and, aided by capillarity, from the surfaces of bottom lands that overlie the gravel filled underflow conduits adjoining and inter connected with the stream channels. Water is also taken from the streams and returned to the atmosphere by the companion process of transpiration incident to the growth of trees, shrubs, weeds, grasses and native vegetation along stream channels and adjoining bottom lands. Their supplies of moisture are obtained via root-systems from the ground waters which, in turn, in arid regions, are recharged from surface flows. Thus the sand beds of the channels and the gravels of underlying and adjoining formations act, through absorption, as a form of temporary storage, increasing the time during which conveyance losses and evaporation take place, and expanding or contracting the effective evaporation area so as to maintain a balance between the inflows thereto, contributed by the surface flows, and the outflows therefrom, consisting of the sum of the consumed and unconsumed waters (Tr. pp. 3363-3365, Vol. XX). Natural conveyance losses in the main river channel, Pueblo to Stateline, approximate 125,000 acre-feet annually (Tr. p. 3696, Vol. XXII).

Total water production in the Arkansas River basin in Colorado as reported by the Master, approximates 1,240,000 acre-feet in an average year. The Master further finds: "the average annual dependable and fairly continuous water supply and flow of the Arkansas River and its tributaries is 1,110,000 acre-feet," (page 10, Master's Report). The Master must have taken this amount from the testimony of Kansas' witness Meeker. Mr. Meeker claims to have computed the total water production in two different ways. Both methods necessarily involve es-

timated and assumed values, (Tr. p. 3644, vol. XXII). His first method involved summations of total stream flows at or near their sources, and his total (Kansas Exhibit 35, Tr. vol. IX, p. 1490), of 1,290,000 acre-feet annually, was subdivided 949,000 acre-feet of mountain runoff and 341,000 acre-feet of plains runoff. Plains runoff, involving 24 percent of the total, was necessarily estimated by applying to the plains drainage area an assumed rate of average annual runoff per square mile of drainage area. Portions of the so-called mountain runoff, similarly, were unmeasured and required estimation. Actually measured items aggregate 684,000 acre-feet, or 53 percent of the total water production as estimated under this first method (Tr. p. 3645, vol. XXII). Under the second of the two methods, the unconsumed outflows crossing the Stateline, averaging 300,000 acre-feet per year during 1912 to 1930, were added to the quantity estimated to have been consumed in Colorado, namely, 940,000 acre-feet per year, giving the total of 1,240,000 acre-feet (Tr. pp. 3693-3698, vol. XXII).

Colorado's witness Patterson, on cross examination, gave an opinion that the total water supply of the Arkansas River in Colorado averaged 960,000 acre-feet per year, (Tr. pp. 3695, vol. XXII). The records show that, during 1912 to 1930, the unconsumed Stateline outflows averaged 300,000 acre-feet; that total consumption of water, incident to diversions from and conveyance losses along the main river channel, averaged 666,000 acre-feet per year; and that the said consumed and unconsumed quantities of main river water together totalled 966,000 acre-feet, or substantially the same as the Patterson estimate of 960,000 acre-feet. The difference of about 300,000 acre-feet between the Meeker and Patterson estimates is due primarily to the inclusion by Meeker of about 300,000 acre-feet of consumptive use assumed to occur, not along the main river, but in tributary areas. Included in the Patterson total of the main river supply are the actual tributary inflows thereto; after their diminution in tributary channels by natural conveyance losses and by consumption incident to

irrigation under senior rights on such tributaries. Hence, the 960,000 acre-feet figure properly represents the total water supply of the Arkansas River (Tr. p. 3695, vol. XXII). If no irrigation uses at all had been made along the main river, about 835,000 acre-feet thereof might have reached the Stateline, — the remaining 125,000 acre-feet being lost in conveyance of the Stateline. (Colo. Exhibit 156—Tr. p. 3653, Vol. XXII).

ALLEGED INCREASED DEPLETION BY COLORADO

The Master finds (p. 9—Master's Report) a material increase in river depletion by Colorado since the taking of testimony in Kansas v. Colorado, in 1907. The finding does not state any amount of increase nor any figures of comparison of flow between 190- and now.

The Master finds (Master's Report p. 10) that an increase in the irrigated acreage necessarily reflects a decrease in the stateline flows.

The facts are that, there was an increase both in acreage and stateline flow. Taking the period from the beginning of the measurement of the stateline flows to the present, the United States Census shows that the Colorado irrigated acreage in the Arkansas basin was 464,236 in 1909 and 469,168 in 1939 (Colorado Exhibit 206, Tr. Vol. XXXVII, p. 6677).

It was alleged in the Bill by Kansas in *Kansas v. Colorado*, 206 U. S. 46, 52:

> "By the year 1891 all the natural and normal waters and a large portion of the flood waters of the Arkansas River were so appropriated, diverted, and actually applied (to distant and non-riparian lands in Colorado) so that the average flow of the river was greatly and permanently diminished and the normal flow of the river, exclusive of floods, was wholly and permanently destroyed;" and that, "the water for the irrigation ditches in the western part of Kansas

has been entirely cut off," * * *, "and the ditches are left dry and the lands uncultivated."

The court, in its opinion of May 13, 1907, summing up those matters which seemed most clearly proved, among other things said, with respect to stream flows:

> "That there is a great variance in the amount of water flowing down the channel at different seasons of the year and in different years is undoubted; that at times the entire bed of the channel has been in places dry is evident from the testimony." (206 U. S. p. 115).

And with respect to the irrigation ditches in Kansas:

> "At one time there were some irrigating ditches in these western counties, which promised to be valuable in supplying water, and thus increasing the productiveness of lands in the vicinity of the stream, and it is true those ditches have ceased to be of much value, the flow in them having largely diminished." (206 U. S. p. 113)

Conditions since 1907 are shown by Colorado Exhibits 208-215, (Tr. pp. 6639-6673, Vol. XXXVII; App. "B," p. 60-67). The witness Meeker, in behalf of the State of Kansas, testified that the stream flows in Kansas at the time of and prior to the original litigation, commencing with the year 1895, were several hundred thousand acre-feet annually greater in amount than in subsequent years and cycles of years, and that the water supplies then available to the Kansas ditches were large and adequate in amount.

Colorado's witness Patterson testified that the status of irrigation in Western Kansas today is vastly improved over what it was in 1910, and over the conditions, as shown by records, that prevailed in 1901 and years prior thereto. All ditches then functioning are operating today and serving greater acreages; all such ditches have been enlarged in capacity; one reservoir has been constructed, known as

Lake McKinnie, which has been of great benefit; that a considerable development of ground water supplies by pumping plants has occurred, greatly benefiting irrigation in the area; but that neither reservoir storage nor ground water developments have as yet been fully developed to their limits; as methods for providing additional and supplemental water supplies for irrigation purposes in Kansas, (Tr. p. 3448, Vol. XX).

As of the year 1893, the expansion of irrigation along the Arkansas River in Colorado, as to construction of new ditches and canals, for purposes of direct diversion, came to an end. Adjudicated direct flow water rights in Colorado on the Arkansas River, listed in Kansas Exhibit 2 (Vol. VI, p. 908), involve a total of 7,415 cubic feet per second, of which 6,861 cubic feet per second, or more than 92 percent have dates senior to 1894. By districts the said adjudicated direct flow water rights in the Arkansas River in Colorado, as summarized from Kansas Exhibit 2, are as follows:

Table 3a

Quantities in Cubic Feet per Second

Water Districts	Senior to 1894	1894 and Later	Combined Totals
11	363.02	31.07	394.09
12	521.43	27.23	548.66
14	2,024.44	7.00	2,031.44
17	2,399.60	401.72	2,801.32
67	1,552.35	87.20	1,639.55
Totals	6,860.84	554.22	7,415.06

In Water District 11, the total appropriations from the Arkansas River of 394.09 cubic feet per second, include 363.02 cfs. with dates senior to 1894. Of the remaining 31.07 cfs. subsequently appropriated, the latest priority is of date June 1, 1897.

In Water District 12, total appropriations of 548.66 cfs. include 521.43 cfs. with dates senior to 1894. Of the 27.23 cfs. subsequently appropriated, 2.40 cfs. thereof represents an enlargement of a previously constructed irrigation ditch (dated August 1, 1896), and the balance was appropriated during years from 1897 to 1909 for refinery, smelter, railroad, power, and related industrial purposes, which largely are non-consumptive in character. Of these industrial appropriations (in Water District 12) 15.31 cfs. thereof are dated in 1897; 0.52 cfs. from 1901 to 1904; and 9.00 cfs. thereof as of March 15, 1909.

In Water District 14, total appropriations of 2,031.44 cfs. include 2,024.44 cfs. dated earlier than 1894, and the remaining 7.00 cfs. represents an enlargement dated in 1894, of a ditch originally constructed in the 1860 decade.

In Water District 17, total appropriations of 2,801.32 cfs. include 2,399.60 cfs. with dates senior to 1894, and 401.72 cfs. with dates from 1903 to 1909, consisting of three items, as follows: (1) 334.92 cfs. to Otero Canal dated February 2, 1903, in virtue of its enlargement, to capture flood waters and to permit of diversions of storage waters released from its Clear Creek Reservoir. Diversions for direct applications by Otero Canal are accomplished, principally, under its construction appropriation for 123.0 cfs. dated August 31, 1893. Its enlargement appropriation functions an average of but 12 days per summer season, and then only fractionally (Kansas Exhibit 7, Vol. IX, p. 1345); (2) 22.0 cfs. dated November 30, 1907, represents developments of ground waters by pumping plants, and not diversions directly from Arkansas River; (3) 44.8 cfs. dated April 15, 1909, represents enlargement of Consolidated Ditch which was originally constructed prior to 1884 and has priorities as of March 13, 1888 and senior thereto aggregating 129.80 cfs., under which its diversions are largely made. Its extension priority dated April 15, 1909 functions an average of but 3 days annually and then only fractionally.

In Water District 67, total appropriations of 1,639.55

cfs. include 1,552.35 cfs. of dates senior to 1894, and 87.20 cfs. of subsequent dates, consisting of two items: (1) 7.20 cfs. to the Sisson Ditch dated December 1, 1895, representing an enlargement of its construction appropriation for 18.0 cfs. dated December 1, 1891; and (2) 80.00 cfs. to the Fort Bent Ditch (initially constructed as of April 1, 1886), representing an enlargement appropriation which functions an average of about 17 days per year (Kansas Exhibit 7, Vol. IX, p. 1345).

Along tributaries of the Arkansas River in Colorado in all Water Districts 10 to 19, (inclusive) and 67, total appropriations for direct diversion aggregate 17,676.02 cubic feet per second, of which 14,941.40 cfs., or about 85 percent thereof, are dated prior to the year 1910. Included therein are the early appropriations of the decades of 1860 and 1870 previously mentioned. The remaining 2,734.62 cfs. of adjudicated direct flow diversion rights are necessarily of the flood-water character, the effect of which on total water supplies is but a small fraction of the indicated 15 percent. (Tr. pp. 3343-3450, Vol. XX).

The total decreed capacities of the approximately 200 reservoirs in Colorado amount to 653,427 acre-feet (Kansas Exhibit 3, Tr. Vol. VI, p. 908), and of the one reservoir in Kansas to about 25,000 acre-feet. The total given for the Colorado reservoirs is exclusive of 82,100 acre-feet of unavailable decreed capacity in Great Plains reservoirs; is exclusive of the conditional decreed rights shown in Kansas Exhibit 3, (Tr. Vol. VI, p. 908) which to date have not been constructed; and includes some reservoirs which though once constructed and operated have since been washed out and are now inoperative. Of the said total capacity in Colorado, 589,018 acre-feet thereof, or more than 90 percent, bear dates senior to the year 1910. Less than 10 percent of the appropriations for storage purposes are dated subsequent to 1909.

Of the total adujdicated storage capacity in the Arkansas River basin in Colorado 415,786 acre-feet thereof, or about 64 percent, attaches to the nine reservoirs con-

structed by the five main-river ditch systems, namely, the Amity, Fort Lyon, Holbrook, Otero and Colorado systems. Together they serve nearly two-thirds of all the lands irrigated along the Arkansas River from Pueblo County to the Kansas Stateline. The said nine reservoirs provide supplemental supplies for the lands under the several main-river ditches which also have direct diversion appropriations as previously summarized. A brief outline of these five major ditch systems, and their appropriations for direct diversions (Kansas Exhibit 2, Tr. Vol. VI, p. 908) and storage (Kansas Exhibit 3, Tr. Vol. VI, p. 908) is as follows:

Amity Canal, construction appropriation 283.50 cfs. as of February 21, 1887; enlargement appropriation 500.0 cfs. as of April 1, 1893; utilizes Great Plains reservoirs, total decreed capacity 265,552 acre-feet, of which 82,100 acre-feet unavailable, leaving 183,452 acre-feet of available capacity, with construction appropriation dated August 1, 1896 (deliveries to lands commenced 1898); reservoirs supplied from Arkansas River, via Kicking Bird Canal and enlargement of Ft. Lyon Canal.

Ft. Lyon Canal, construction appropriation 164.64 cfs. as of April 15, 1884; enlargement appropriations 597.16 cfs. as of March 1, 1887, and 171.20 cfs. as of August 31, 1893; later (1897) enlarged to total capacity of about 1800 cfs. to carry storage water to Kicking Bird Canal and Great Plains reservoirs. For its own lands, two reservoirs constructed: Adobe Creek, construction appropriation 61,575 acre-feet as of January 25, 1906, enlargement appropriation 25,425 acre-feet as of December 29, 1908; and Horse Creek, construction appropriation 26,887 acre-feet as of January 25, 1906, enlargement appropriation 1,113 acre-feet as of January 12, 1908; Adobe Creek reservoir supplied by feeder canal from Adobe Creek, Horse Creek reservoir supplied by feeder canal from Horse Creek, and both supplied from Arkansas River via Ft. Lyon storage canal. (Note: diversion capacities for storage purposes of Ft. Lyon Storage Canal and enlargement for storage

purposes of Ft. Lyon Canal were not included in previously mentioned capacities and appropriations for direct delivery.)

Holbrook (Lake) Canal, construction appropriation 155.0 cfs. as of September 25, 1889; enlargement appropriation 445.0 cfs. as of August 30, 1893, incident to construction of two reservoirs: Holbrook No. 1, construction appropriation 4,276 acre-feet as of March 2, 1892, enlargement 3,196 acre-feet as of September 15, 1909; and Dye Lake, construction appropriation 4,500 acre-feet as of October 10, 1903, enlargement 3,486 acre-feet as of September 3, 1909.

Otero Canal, construction appropriation 123.0 cfs. as of March 3, 1890; enlargement 334.92 cfs. as of February 2, 1903, incident to construction of Clear Creek reservoir (in mountains), construction appropriation 9,420 acre-feet as of June 12, 1902, enlargement 2,308 acre-feet as of August 20, 1910 (attained merely by increasing the level of spillway crest); and incident to extension of Otero Canal to serve lands south of La Junta, which extension subsequently was abandoned due to inadequate water supplies.

Colorado Canal, construction appropriation 756.28 cfs. as of June 9, 1890; for direct irrigation and for storage in two reservoirs; Lake Henry, construction appropriation 6,355 acre-feet as of 1891, enlargement 3,561 acre-feet as of May 15, 1909; and Lake Meredith, construction appropriation 26,028 acre-feet as of March 9, 1898. System also includes Twin Lakes reservoir, on Lake Creek in mountains, with construction appropriation 20,645 acre-feet as of December 15, 1896, enlargement 33,807 acre-feet as of March 29, 1897. To supplement the chronically deficient water supplies of the system, and to recover lands that could not be irrigated during recent drought cycle, an importation project has been constructed by the system, at a cost of several million dollars, to divert 46,000 acre-feet annually from tributaries of Colorado River and deliver the same, via a tunnel through the Continental Divide at Independence Pass, into Twin Lakes reservoirs and thence

via the river and Colorado Canal to the lands of the system (Colorado Exhibit 194, Tr. Vol. XXXVII, p. 6513; App. "B," p. 36-41).

The fact that the above mentioned canals along the Arkansas River in Colorado, constructed initially during the years 1884 to 1893, shortly thereafter began the construction of reservoirs in order to supply their lands then under irrigation with adequate, or more nearly adequate, quantities of water, indicates that the river did not at that time furnish dependable, seasonal water supplies, and that, instead, the water supplies beginning with 1889 and thereafter were inadequate in amount and non-dependable in character (Tr. p. 3426, Vol. XX).

Shortages are experienced under all main river ditches with frequencies that increase with the junior dates of their appropriations.

COLORADO DIVERSIONS AND STATE LINE FLOW.

Stream flows crossing the Stateline from Colorado into Kansas have increased in their usable amounts. Waters recovered by some of the drains constructed in Colorado are delivered directly to Kansas and the ditches in that state. All the discharges of the Holly drain, which flow continuously at rates averaging about 25,000 acre-feet annually (Colorado Exhibit 129, Tr. Vol. XIX, p. 3244; Kansas Exhibit 17, Tr. Vol. IX, p. 1440; etc.), are delivered to Kansas crossing the Stateline either in the Frontier ditch or in the river channel or both.

Throughout the period since 1907, during which the Stateline flows from Colorado into Kansas have been measured and recorded, there has been no diminution in the quantities of water usable for irrigation in Kansas and used by ditches in that state. The quantities of water diverted by the Kansas ditches (Colorado Exhibit 213—Vol. XXXVII p. 6653; App. "B," p. 65) (Table 30, p. 127, appendix "A") though varying from season to season, and year to year, in accordance with natural climatic con-

ditions, have gradually increased in amount. From records of the diversions made from the Arkansas River by ditches in Colorado, which records begin with the year 1904, such increases in the quantities diverted as have been recorded are attributable to the inclusion, as part of the diversion records, of increasing amounts of return flows, being waters which once recorded when first diverted are again recorded as re-diverted.

Witness Meeker, in behalf of Kansas, undertook an elaborate series of calculations and estimations, termed an analytical study (Kansas Exhibits 24 to 70, vols. IX-X, pp. 1462-1569). This so-called analytical study purports to disclose the total original water production in Colorado, year by year from 1895 to 1930; the Stateline flows each year from 1895 to 1907 (prior to the years of measurement thereof), based on estimates made from observations at other stations, some hundreds of miles away; and the quantities of water consumed in Colorado, based on calculations of main river consumption during 1912 to 1930, with estimates based on assumed unit rates in upriver and tributary areas, and on a different method of estimation, for the years 1895 to 1911, in which all the conclusions of that period were derived from initially assumed unit rates. Comparing the results of the earlier period, based on one method of estimation, with the results of the later period, based on another and different method of estimation, the witness Meeker says, that Colorado has increased its consumption of stream flows and its depletion of water supplies by 300,000 acre-feet (Tr. p. 1566, vol. X).

Colorado witness R. J. Tipton (Colorado Exhibits 83 to 122, vol. XIX, pp. 3117-3217), testified that, from the records of stream flows, diversions and return flows, including the records of diversions made from the Arkansas River by ditches in Colorado from 1904 to 1911, that Colorado's depletions of the main river water supplies have not increased during the period 1904 to 1932.

Kansas witness Geo. S. Knapp, testified, in effect, that regardless of the evidence disclosed by records of

Stateline flows and of ditch diversions in Colorado and their effects on stream flows and water supplies, the increased irrigated acreages in Colorado indicate that depletion to the extent of 400,000 acre-feet has occurred, because each acre of irrigated land constitutes a fixed and invariable burden on the water supply (Tr. pp. 5220, Vol. XXIX).

Colorado witness C. L. Patterson, testified that the quantities of water diverted by certain major ditches in Colorado had remained substantially constant over periods of three and four decades, during which the acreages irrigated thereunder had increased and the return flows therefrom had increased (Tr. pp. 3667-3669, vol. XXII). That although the quantities of water consumed and returned to the atmosphere by evaporation and transpiration may be a fairly constant quantity under given climatic conditions and uniform irrigation practices, the quantities of water withheld from the stream, by being retained in underground storage, are large during early years and decades of diversion operations, and decline thereafter; and as return flows increase in amount the total quantities of water consumed and withheld from the stream, and the unit rates of consumption per acre irrigated, instead of being constant, actually and in fact decline in amount with age (Tr. pp. 3680-3683, vol. XXII).

Since the Stateline flows as recorded during 1908 to 1930 averaged, in round numbers, 300,000 acre-feet (Tr. pp. 6509-6542, vol. XXXVII, Colo. Ex. 193), then the Stateline flows during previous years, if they have since been depleted 300,000 or 400,000 acre-feet as alleged, must have averaged 600,000 or 700,000 acre-feet per year. If such Stateline flows actually existed, as alleged, a large share thereof, approximating one-half of the total, must have come from the Colorado mountains. Total original water production in plains areas, estimated by the witness Meeker at 340,000 acre-feet (Kansas Exhibit 35, Tr. vol. IX, p. 1490), when measured at the Stateline, to allow for its diminution by natural channel conveyance losses, would

not exceed and might be substantially less than 300,600 acre-feet. Since plains runoff accounts for half, or less, of the claimed total Stateline flows, mountain runoff must have contributed the remaining half or more. Mountain runoff is perennial, and, by the witness Meeker, is designated as dependable. If the claims advanced by the witnesses Meeker and Knapp be correct, that the Stateline flow from Colorado into Kansas during the years prior to 1908, averaged 600,000 or 700,000 acre-feet annually, they must have consisted of fluctuating amounts of plains floods, making up about half the total, and of more or less constant amounts, year by year, of perennial and dependable stream flows from the Colorado mountains making up the other half, or say 300,000 acre-feet annually as claimed in Kansas Exhibit 99, (Tr. vol. X, p. 1750).

The Meeker study purports to cover the period of 36 years from 1895 to 1930, and, by comparisons between the average values of early and recent periods, to disclose the changes which have occurred in the consumption of stream flows and depletion of water supplies in Colorado. Since the methods of arriving at the figures were not uniform throughout the period, it becomes necessary, in order to evaluate the comparative results, to consider both the methods and the probable accuracy of the calculations, estimates and assumptions.

The Stateline flow values for the years after 1907 were measured, whereas those for prior years were deduced, i.e., estimated from stream flows recorded at other stations, some of which, as at Hutchinson, were long distances away (Tr. p. 3642, vol. XXII). Estimated Stateline flows during the first 12 years of the period, from 1895 to 1906, averaged 421,700 acre-feet per year, and recorded Stateline flows during the last 12 years of the period, from 1919 to 1930, averaged 349,200 acre-feet per year (Kansas Exhibit 62, Tr. vol. IX, p. 1519). The indicated diminution was 72,500 acre-feet. This indicated decline may be attributable to the uncertainty and liberality of the estimates for the earlier years. Each of the twelve

year periods contain two extra large or unusual years. The value estimated for 1900 was 980,000 acre-feet and for 1905 was 950,000 acre-feet, which values are extraordinary and questionable, since they equal or exceed the recorded quantities of 960,000 acre-feet in 1921, the year of the greatest flood of record, and of 820,000 acre-feet in 1923, which was the wettest year of record to the time of the so-called analytical study (Kansas Exhibit 62, Tr. vol. IX, p. 1519).

The Meeker so-called analytical study, with respect to the question of alleged increased consumption and depletion in Colorado, presents an important discrepancy found in the methods and the initial assumptions under which the total consumption of water, in the early and recent periods, was calculated or estimated and thereafter compared. Results for the period 1912 to 1930 were in part estimated and in part calculated from stream flow, diversion, and return flow records. Consumption of water in all upriver and tributary areas in Colorado was estimated by assuming the unit rates of consumptive use per acre irrigated (Tr. p. 3643, vol. XXII), and these estimated or assumed results were then added to the main river values to make up the alleged total consumption. Along the main Arkansas River from Canon City to the Stateline, the results are said to be calculated by the inflow-outflow method, under which the excess of inflow over outflow values was designated the amount consumed (Tr. p. 3642, vol. XXII). The tributary inflows were largely unmeasured and must be estimated or assumed. If the tributary inflows be estimated too high, then the resulting answers as to total water production and consumption would be too high (Tr. p. 3648, vol. XXII). Terming the results for 1912 to 1930 as calculated, these are compared with results for the period 1895-1911, arrived at by a wholly different process of estimation wherein the unit rates of consumptive use per acre irrigated were arbitrarily assumed.

The said calculated results for the main river section, Canon City to Stateline, summarized from Kansas Exhibit 56, (Tr. vol. IX, p. 1513), in the average year of the periods shown, were as follows:

Table 3b

Period of Years	Consumption (Acre-Feet)	Irrigated (Acres)	Consumption Per Acre
1912-15	906,250	326,500	2.78
1916-20	834,400	345,800	2.41
1921-25	750,600	333,600	2.25
1926-30	766,000	352,600	2.17

Comparing the period 1912-15 with 1926-30, there was an increase of 26,000 acres in the area irrigated, accompanied by a decline of 140,000 acre-feet in the total quantity of water consumed and thus withheld from the Arkansas River and from Kansas. There was a consistent decline in the amount of water consumed per acre irrigated, indicating that of the quantities of water diverted from the Arkansas River for direct application and storage purposes, increasing portions thereof were returned to the river unconsumed, and diminishing portions thereof were consumed or withheld (Tr. p. 3657, vol. XXII).

Having calculated the water consumption along the main Arkansas River, Canon City to Holly, as above outlined, Mr. Meeker added these calculated values (Col. 2 of Kansas Exhibit 59, Tr. vol. IX, p. 1516) to the estimated consumption in mountain valleys above Canon City, in which both the upriver and tributary unit rates were wholly and arbitrarily assumed, thus arriving at the total consumption in Colorado. These total values are reproduced in Kansas Exhibit 60, (Tr. vol. IX, p. 1517) and, after adjustments for storage in and release of water from mountain reservoirs, are divided by the irrigated areas, to arrive at unit rates of consumptive use in Colorado, as follows:

Table 3c

Period of Years	Consumption (Acre-Feet)	Irrigated (Acres)	Consumption Per Acre
1912-15	1,147,000	485,000	2.35
1916-20	1,080,000	516,400	2.10
1921-25	1,018,000	517,400	1.95
1926-30	1,048,000	541,000	1.95

Comparing the first and last periods, an increase of 56,000 acres occurred in the irrigated area, accompanied by a decline of 99,000 acre-feet in the quantities of water consumed.

The Meeker claim of an increased depletion of 300,000 acre-feet is based solely upon what he terms computed values (Kansas Exhibit 61, Tr. vol. IX, p. 1518) for the period prior to 1912. They were computed by multiplying the number of acres irrigated by what he terms "appropriate consumptive use values," which values were arbitrarily assumed. He says they were "deduced from actual values 1912 to 1930, modified by character of yearly water supply, reservoir storage and related matters."

With respect to reservoir operations Mr. Meeker asserts (Tr. p. 3659, vol. XXII), that operating storage was limited to 240,000 acre-feet at the time of the original interstate case, and that subsequently 380,000 acre-feet have been added. At Tr. pp. 3659-3664, vol. XXII, this is shown to be erroneous and his allowances based thereon must also be in error. For example, the Great Plains reservoirs were constructed to a total (available and unavailable) capacity of 265,552 acre-feet, beginning August 1, 1896. They were completed, the unavailable capacity had been filled, and water was being released and used in 1899. The capture during 1898 and 1899, together with the capture of 114,148 acre-feet in 1900, filled the reservoirs to their capacity (Tr. pp. 3660, vol. XXII). There are nine major reservoirs in Colorado with construction priorities senior to the Great Plains. Total decreed capacity of all major reservoirs constructed to date is 697,347 acre-feet (Colo-

rado Exhibit 157, Tr. vol. XXII, p. 3661). Those having priorities in 1907 and prior thereto aggregate 535,110 acre-feet, or 88 percent of the total. Of these early reservoirs 490,016 acre-feet of capacity attaches to the main river. Reservoirs constructed since 1907 have aggregate capacities of 72,237 acre-feet, which in part represents subsequent enlargements of previously constructed reservoirs. In the average year the Colorado reservoirs capture 21.5 percent of their decreed capacities, or about 130,000 acre-feet annually. As indicated by operations of the Great Plains Reservoirs, the quantities captured and stored were no greater after 1912 than before, the record thereof showing (Tr. p. 3660, vol. XXII):

Table 3d

Period of Years	Avge. A. F. Stored
1899 to 1908	62,408
1909 to 1918	54,024
1919 to 1928	54,113

Diversions made during early years of irrigation project operations are commonly large per acre irrigated, due, among other things, to dryness or emptiness of sub-soil and underground strata (Tr. p. 3687, vol. XXII). For example, the records of diversions from the Arkansas River made by the Amity Canal, the acreages irrigated, and the rates of diversion per acre, were as follows (Tr. pp. 3667-3669, vol. XXII):

Table 3e

Period Of Years	Diversions A.F./Year	Acreages Irrigated	Diversions Per Acre
1894-1903	75,186	10,398	7.2
1904-1913	81,549	26,550	3.4
1914-1923	87,184	33,825	2.6
1924-1930	81,453	36,921	2.2

Much of the total acreage expansion along the Arkansas River, since the original *Kansas v. Colorado* case, has occurred under the Amity and Fort Lyon irrigation systems, whose diversions from the river for storage and irrigation purposes, are made via three canals, namely, the Ft. Lyon Storage Canal, Ft. Lyon Canal and Amity Canal. Aggregate diversions of the three canals were 316,895 acre-feet per year during 1904 to 1913; 375,093 acre-feet per year during 1914 to 1923 (which included the four large water years of 1914, 1915, 1921 and 1923); and were 307,000 acre-feet per year during 1924 to 1933 (Tr. p. 3690, vol. XXII). During the period the river gains due to return seepage along the stretch from La Junta to Holly, adjoining the lands of these systems, increased from an average of 58,500 acre-feet per year during 1897 to 1904, to an average of 141,700 acre-feet per year during 1922 to 1925 (Tr. pp. 3691; vol. XXII). With diversions fairly constant, and with increased return flows, the increased acreages under the Ft. Lyon and Amity Systems have not depleted the water supplies of the river (Tr. p. 3692, vol. XXII).

The amount of water consumed in Colorado and thus withheld from the Arkansas River and from Kansas, is measured, not by the acreage to which the water may be applied, but by the quantities of water diverted from the river that are not returned thereto. Records of the diversions from the Arkansas River by ditches in Colorado are available for the period from 1904 to date. Such records were summarized by the witness Meeker for all ditches from Canon City to the Stateline for the period from 1912 to 1930, as shown in Kansas Exhibit 96, (Tr. vol. X, p 1744). Although he submitted information as to the diversions of some ditches at Canon City for years prior to 1912, he elected to ignore the records of ditches from Pueblo to Stateline for the period 1904 to 1911, to abandon the method of analytical study such as employed for the period 1912 to 1930, and, in lieu thereof, to estimate the consumption based on arbitrarily assumed rates. Diversion records of the same Canon City to Stateline ditches, summarized in Kansas Exhibit 96 for the period 1912 to 1930, appear

in Colorado Exhibit 194, (Tr. vol. XXXVII, p 6513; App. "B," p. 36-41) for the period 1931 to 1940. Aggregate diversions in acre-feet per year, averaged for the periods shown in Kansas Exhibit 96, and for similar five year periods from Colorado Exhibit 194, were as follows:

Table 4

Average Annual Diversions from Arkansas River Ditches in Colorado—Canon City to Stateline. (Values in Acre-Feet).

Period of Years	Average Annual Diversions	
1912 to 1915	1,145,000	
1916 to 1920	1,122,000	
1912 to 1920		1,132,000
1921 to 1925	1,064,000	
1926 to 1930	1,116,000	
1921 to 1930		1,090,000
1931 to 1935	822,000	
1936 to 1940	932,000	
1931 to 1940		877,000

The said diversions, Canon City to Stateline, include all quantities diverted above and by-passed around the stream-gaging station at Canon City; all waters imported from other stream systems; all waters released from upstream reservoirs; all waters diverted for irrigation, municipal, industrial and other beneficial purposes; all waters diverted for direct application and for storage purposes, including waters diverted but unapplied to lands and wasted back to river (estimated in Kansas Exhibit 96 to average 110,000 acre-feet annually); and all waters which, measured once as diverted, are returned unconsumed and again rediverted and remeasured, and again included in said totals.

Diversion records are shown in Colorado Exhibits 91 to 97, (Tr. vol. XIX, p. 3153), for the years 1904 to 1911; in Kansas Exhibits 7(a) to 7(s) (Vol. IX, p. 1345) for the years 1912 to 1931; in Colorado Exhibit 152 (Tr. vol. XXI,

p. 3593) for the year 1932; in Colorado Exhibits 98 and 98(a) (Tr. vol. XIX, p. 3161) the records are summarized for the period 1904 to 1932; and for subsequent years may be derived from data summarized in Colorado Exhibit 194 (Tr. Vol. XXXVII, p. 6513; App. "B," p. 36-41). All the said ditch diversion records were originally reported and published by the same agency, *i. e.*, the State of Colorado, Irrigation Division Engineer, in co-operation with the Arkansas Valley Ditch Association. Average annual diversions of said ditches during periods prior and subsequent to 1912, together with the river gains due to return flows, and the indicated depletions of the original water supplies, are shown in the following:

Table 5.

Average Annual Diversions, Returns and Depletions
Arkansas River—Pueblo to Stateline.
(Values in Acre-Feet)

Periods	Diversions (a)	Returns (b)	Depletions (c)
1904-1911	906,000	120,000	786,000
1912-1920	984,000	186,000	798,000
1921-1930	987,000	256,000	731,000
1931-1940	787,000		

(a) Data from Colo. Ex. 91 to 98; 102; 194; (App. "B," p. 36-41; Kans. Ex. 7(a) to 7(s). Aggregate diversions all ditches below Pueblo, plus Bessemer, Arkansas Valley and miscellaneous ditches above Pueblo.

(b) Net river gains due to return seepage, Pueblo to Stateline, from testimony of C. L. Patterson (Tr. pp. 883-885, vol. VI); Kans. Ex. 32 (Tr. vol. IX, p. 1485, App. "B,", p. 72) used 130,000 for 1910; 186,000 for 1912 to 1920; and 240,000 for 1921 to 1930.

(c) Depletions are differences, i. e., diversions minus returns,—the indicated depletions exceed actual depletions by the quantities diverted and returned unconsumed, but not classified as return seepage.

Acreages irrigated along the Arkansas River between Pueblo and the Stateline, in Water Districts 14, 17, and 67, increased 53,230 acres, from an average of 299,660 acres during the period 1904 to 1911 to 352,890 acres per year during 1921 to 1930 (Kansas Exhibit 51, Tr. vol. IX, p. 1507).

Information concerning acreages irrigated in upriver (above Canon City) and tributary areas is available, but there are no records of diversions and returns from which to ascertain the depletions incident thereto. Admittedly, the consumptive use of water per acre irrigated is substantially less in upriver and tributary areas than along the lower main river, where from 63 to 70 percent of the total irrigated areas in the Arkansas River basin in Colorado are located. Having determined the effects of irrigation and increased acreages along the lower main river, the question arises as to the less extensive and scattered areas upstream and on tributaries. In all Water Districts of Irrigation Division No. 2, other than districts 14, 17, and 67 (main river districts), there was an increase of 54,880 acres, from an average of 121,458 acres during 1904 to 1911, to an average of 176,338 acres during 1921 to 1930 (Kansas Exhibit 51, Tr. vol. IX, p. 1507).

The natural precipitation, runoff, stream flows and water supplies of the 1880 decade were abnormal or above average. (Tr. pp. 3698-3700, vol. XXII). At that time, and during the first few years of the 1880 decade, large canals were constructed along the Arkansas River in Colorado, and the practice of irrigation began in Kansas. All these recently constructed enterprises in both states found themselves in great difficulty when the drouth of 1889-1894 occurred, giving rise to subnormal or below average stream flows and water supplies. The Kansas ditches became involved in receiverships, about 1894, and thereafter until about 1905 were more or less abandoned and largely useless, as determined in the 1907 decree in *Kansas v. Colorado*. Then from 1905 to 1910 they were rehabilitated and the period of development of underflow and underground waters began in Western Kansas.

The United States Census Bureau reported that in 1909 there were 464,236 irrigated acres in the Arkansas basin in Colorado, and in 1939 the figure was 469,168 (Colorado Exhibit 206, vol. XXXVII, p. 6622) The consumption of water in Colorado has declined according to evidence presented by Kansas itself. Kansas Exhibit 56

(Tr. p. 1513, vol. IX) as summarized in Table 36, p. 77, Appendix "A," shows a decline in water consumption for the main river section Canon City to Stateline, from 906,250 acre-feet as the annual average for the 1912-1915 period to 766,000 for the 1926-1930 period. A further decline since 1930 appears in Colorado Exhibit 194, page 3 (App. "B," p. 38), which shows that the ditch diversions along the main river have been less since 1930 than the average prior to 1930 (Tr. p. 6513, vol. XXXVII).

RETURN FLOWS.

At first, all the waters diverted by ditches and applied to lands were withheld from the stream. One portion thereof was consumed by evaporation and transpiration, and being returned to the atmosphere, was withheld from the stream from whence diverted. The second and remaining portion percolated downward through the soils, subsoils and underground formations where, being retained in such underground storage, it was withheld from the stream. With continued diversions and applications from year to year, and with continued contributions to the underground waters, their surface levels were elevated until, in time, gradients toward the river channels were established, in lieu of the original and natural conditions under which the surface flows disappeared into the absorbent sands and gravels of the stream valleys. As the water tables continued to increase in elevation, with increasing gradients toward the river, less of the unconsumed waters percolating downward from ditches and irrigated lands were retained in ground storage, and greater portions thereof seeped back or returned to the stream. Thus, in time, what had previously been a losing river was converted into a gaining stream along its stretches where the return flow quantities attained volumes in excess of natural conveyance losses (Tr. pp. 3686-87, vol. XXII).

In the Arkansas River valley the first official measurements were made during the years 1897 to 1904. These disclosed that the river gained in volume, between Pueblo and the Stateline, by an average of 106,000 acre-feet per

year, (Tr. p. 883, vol. VI). The measured river gains represent the net effects of the return flow waters. Actual volumes of the return flows reaching the river necessarily exceeded the measured effects thereof in causing river gains, by whatever natural channel losses prevailed along the river section. Such channel natural conveyance losses, between Pueblo and the Kansas Stateline, average 126,300 acre-feet annually (Tr. p. 3682, vol. XXII):

Similarily conducted measurements made during the years 1922 to 1925 disclosed that river gains due to return seepage had increased by 150,000 acre-feet annually, and were then of a magnitude of 256,000 acre-feet per year (Tr. p. 884, Vol. VI). The net river gains of the 1922 to 1925 period, averaging 256,000 acre-feet annually, approximate 40 percent of the total flow of the Arkansas River as it emerges from the mountains at Canon City (Tr. p. 3427, Vol. XX).

In the stretch of river from Lamar to the Stateline, adjoining the lands irrigated under the Amity Canal, the river gain due to return flows increased from 20,000 acre-feet per year during 1897 to 1904, to 50,000 acre-feet during 1922 to 1925. This gain of 30,000 acre-feet has largely accrued to the benefit of the Kansas ditches (Tr. p. 3669, vol. XXII).

By reason of the said increase in return flow quantities, amounting to 150,000 acre-feet between the periods of 1897 to 1904 and 1922 to 1925, and by reason of other factors connected with irrigation development, increased areas of land were irrigated in the counties of Pueblo, Crowley, Otero, Bent and Prowers in Colorado, where such increased return flows developed and became available for additional diversions and utilization. These increased areas coming under irrigation were located under enterprises previously constructed—no new ditches for direct irrigation have been initiated after 1893 along the Arkansas River in said counties. Reservoirs were constructed which conserve, and made available for additional use, waters which previously were unused and wasted and which served no beneficial purpose in either state, and such

reservoirs were important factors in connection with the increased diversions and areas of land irrigated.

In addition, from the time of the original interstate litigation to the present, increasing quantities of water were imported to the Arkansas River from other streams systems. Such imported quantities increased from substantially zero at the time of the original *Kansas v. Colorado* case, to approximately 60,000 acre-feet in the season of 1938 (Colorado Exhibit 194, Tr. Vol. XXXVII, p. 6513; App. "B," pp. 36-41). These imported waters are largely diverted in Pueblo County and are used in Pueblo, Crowley and Otero counties.

Conservation of water resources in Colorado has been aided and promoted by the construction of artificial drainage as and when needed. Water recovery by drains (Colorado Exhibits 124-129, Tr. Vol. XIX, p. 3244) added to the return flows and usable water supplies, by eliminating the evaporation losses from seeped or water-logged lands.

As irrigation is practiced year after year the return flows are increased. The unchallenged Colorado evidence is that return flows had increased to an extent such that river gains from Pueblo to the Stateline averaged 106,000 acre-feet annually during 1897-1904, (Tr. p. 883, Vol. VI) and thereafter a further increase of 150,000 acre-feet occurred, until the river gains due to return seepage during 1922-1925 averaged 256,000 acre-feet annually, (Tr. p. 884, Vol. VI).

Factors contributing to an increase in both the irrigated acreage and the Stateline flows are (1) the importation of water from other stream systems amounting to approximately 60,000 acre-feet in 1938, (Colo. Ex. 194, Tr. pp. 6513, Vol. XXXVII; App. "B," pp. 36-41) (2) the construction of artificial drainage, (Colo. Exhibits 124-129, Tr. pp. 3244, Vol. XIX) and (3) improvements in the duty of water resulting from increased efficiency in the conveyance, application and use of water (Tr. p. 3683, Vol. XXII).

Reservoirs store winter and flood waters that are not used for direct irrigation. If such water were not stored, it would pass out of the basin unused. Evaporation losses from storage reservoirs are unimportant in this case because they represent the loss of water which would be lost for irrigation in any event. In spite of these evaporation losses the storage reservoirs, by conserving water that would otherwise be unavailable, increase the usable suplies.

CONDITIONS IN KANSAS SINCE THE 1907 DECISION

IRRIGATED ACREAGE AND KANSAS DIVERSIONS.

Census figures show that in 1909 there were irrigated in the Arkansas River basin in Kansas 35,357 acres, and, in 1934, 94,064 acres; and in the three counties of Hamilton, Kearney and Finney the increase was from 34,819 acres in 1909 to 56,341 acres in 1939 (see Table 7, p. 90, Appendix "A").

Kansas ditch diversions have increased from an average of 59,200 acre-feet annually for the 1908-1913 period to 99,100 annually for the 1933-1938 period (Colorado Exhibit 213, Vol. XXXVII, p. 6653; App. "B," p. 65). Table 30, p. 127, Appendix "A." The amount of diversions has steadily risen in proportion to what Kansas itself has set up as index flows (Table 5a, p. 88, Appendix "A." Since 1907, the Kansas diversions have steadily increased from the standpoint not only of their actual amount but also of their relationship to what Kansas calls the dependable flow of the river. The index flows are taken from a Kansas exhibit. The diversions are of the Kansas ditches. The computations disclose that for the 1908-1913 period the diversions represented 8.9% of the index, or what Kansas calls the dependable, flow. For the years 1933-1938, the percentage is 18.3. The average for the entire 31-year period is 12.6%.

The flows at the Index Stations provided for in the Master's Report (pp. 12, 16, 21) and their relation to Kansas ditch diversions are as follows:

TABLE 5a

RELATIONS BETWEEN INDEX FLOWS AND KANSAS DIVERSIONS

(Compiled from Kans. Ex. 134, Tr. Vol. XXXIX, p. 7019 App. "B," p. 73 and Colo. Ex. 213, Tr. Vol. XXXVII, p. 6653, App. "B," p. 65)

Six Year Periods	Average Annual Index Flows (Acre-Feet)	(% Avg.)	Average Annual Diversions of Ditches in Kansas (Acre-Feet)	(% Avg.)	(% Index)
1908-13	667,510	99.6	59,200	69.7	8.9
1909-14	741,910	110.7	67,700	79.7	9.1
1910-15	719,100	107.3	69,700	82.1	9.7
1911-16	736,160	109.8	73,900	87.0	10.0
1912-17	734,170	109.5	73,600	86.7	10.0
1913-18	726,750	108.4	72,600	85.5	10.0
1914-19	764,270	114.0	84,300	99.3	11.0
1915-20	736,530	109.9	86,900	102.4	11.8
1916-21	750,220	111.9	81,200	95.6	10.8
1917-22	723,360	107.9	77,000	90.7	10.6
1918-23	783,350	116.9	87,300	102.8	11.1
1919-24	784,820	117.1	85,100	100.2	10.9
1920-25	747,270	111.5	88,200	103.9	11.8
1921-26	726,050	108.3	82,600	97.3	11.4
1922-27	726,560	108.4	92,100	108.5	12.7
1923-28	743,000	110.8	97,000	114.3	13.1
1924-29	687,630	102.6	98,100	115.5	14.3
1925-30	673,460	100.5	108,200	127.4	16.1
1926-31	654,070	97.6	99,000	116.6	15.1
1927-32	638,810	95.3	94,900	111.9	14.9
1928-33	590,550	88.1	92,000	108.5	15.6
1929-34	533,120	79.5	85,600	100.9	16.1
1930-35	503,830	75.2	82,000	96.7	16.3
1931-36	512,760	76.5	82,600	97.4	16.2
1932-37	527,350	78.7	84,000	99.0	16.0
1933-38	540,350	80.6	99,100	116.8	18.3
1908-38	670,380	100.	84,900	100.	12.6

Index Flows are the sum of Arkansas River at Canon City, adjusted to exclude importations and to include quantities by-passed around the station, to indicate mountain runoff, plus contributions of Purgatoire River to Arkansas River, to indicate plains runoff (Per Kans. Ex. 134, App. "B," p. 73.

Diversions of Kansas ditches per Colo. Ex. 213 (App. "B," p. 65).

Official information concerning irrigation has been included in all decennial reports of the U. S. Census Bureau, beginning with that of 1890, to date, each relating to the preceding crop season. Irrigation was the subject of a Special Census conducted by that agency in 1902, at the time of the adoption by Congress of legislation commonly referred to as the Reclamation Act. A summary of data from U. S. Census Reports, appearing in the record among other places, as Kansas Exhibits 51, 52, (Tr. Vol. IX, p. 157); Colorado Exhibits 196, (Tr. Vol. XXXVII, p. 6551, App. "B," 47-51), 206 (Tr. Vol. XXXVII, p. 6628); and as testimony at pp. 1819-23, Vol. XI, 2356, Vol. XIV, 5583, Vol. XXXI, 5608, Vol. XXXI, shows:

There are 31 counties in the Western division of Kansas, all of which are subject to the less-humid or more arid climate of that region. Of these, 17 counties, largely in Northwestern Kansas, are wholly outside the basin of the Arkansas River, and in general are favored by somewhat greater amounts of precipitation than the counties in the southwestern portion of the state, wherein the remaining 14 counties are located wholly or in part within the basin, and five of these, namely, Hamilton, Kearney, Finney, Gray and Ford, are situated on and crossed by the channel of the river.

A comparison of irrigation in Kansas and in Colorado, is shown by the following statistics from the 1930 census (see Tr. pp. 3338 *et seq*, Vol. XX).

TABLE 6

	Kansas Acres	Colorado Acres
Total Land Area	52,335,360	66,341,120
Land in Farms	46,975,054	28,876,171
Cropland	26,535,054	8,448,684
Harvested Crops	24,308,361	6,750,308
Irrigated Land	71,290	3,393,619
Irrigable Acreages	95,719	4,528,251

The testimony of Mr. Patterson is (Tr. p. 3346, Vol. XX):

> "The only logical conclusion to be drawn from such statistical records is that irrigation in Kansas plays a very minor part as compared to the major part which irrigation plays in the agriculture of the Arkansas River Basin in Colorado."

TABLE 7

Irrigated Acreages in Arkansas River Basin
In Colorado and Kansas

		Data for State of Kansas			
Year	Basin in Colorado	Entire State	Ark. R. Basin (a)	Five Counties (b)	Three Counties (c)
1889	144,858	20,818	17,821	17,572	15,499
1899	281,592	23,620	19,483	18,570	17,924
1902	300,115	28,922	.....	.....	.....
1909	464,236	37,479	35,357	34,879	34,819
1919	(641,476)(d) 516,213	47,312	46,539	41,485	(40,660)(e) 52,949
1929	557,933	71,290	68,781	60,897	60,072 (f)
1939	469,168	99,980	94,064	64,104	56,341

(a) Data for Arkansas River basin in Kansas excludes areas in Cimarron River valley, but includes areas in tributaries entering below Garden City, as Pawnee Creek, and includes areas irrigated from ground waters, as Scott County and elsewhere.
(b) Five Counties are Hamilton, Kearney, Finney, Gray and Ford.
(c) Three Counties are Hamilton, Kearney and Finney.
(d) Per Colorado Exhibit 206: "Believed too large by reason of inclusion of lands under Carey Act and other projects for which irrigation works were not completed,"—Figure below from Kansas Exhibit 51, i.e., District Water Commissioner Reports.
(e) Kansas witness Knapp (T., p. 2355, Vol. XIV) contends figure is too low,—suggests substitution of figure below, from Kansas Exhibit 115, Vol. XIV, p. 2355.
(f) 46,837 acres irrigated with river water, 13,235 acres served by wells and pumps.

Information concerning the extent of irrigated acreages in the Arkansas River basin in Colorado is also available, year by year, from reports of District Water Commissioners, summaries of which appear in the record as Kansas Exhibit 51, (Tr. Vol. IX, p. 1507,) to and including the year 1930, and as Colorado Exhibit 206, (Tr. Vol. XXXVII, p. 6622,) for the years 1931 to 1940, as shown in the following:

TABLE 8

Irrigated Acreages in Arkansas River Basin in Colorado
As Reported by District Water Commissioners
Compiled From
Kansas Exhibit 51, Years 1896-1930
Colorado Exhibit 206, Years 1931-1940

Years	Acres	5-Yr. Avge	Years	Acres	5-Yr. Avge
1896	380,637		1921	518,947	
97	348,199		22	496,366	
98	331,336		23	523,105	
99	324,903		24	543,779	
1900	349,729	347,000	1925	505,448	518,000
1901	354,043		1926	544,868	
02	312,484		27	524,033	
03	337,050		28	536,701	
04	368,109		29	544,214	
1905	387,731	352,000	1930	554,814	541,000
1906	382,827		1931	535,377	
07	439,515		32	500,241	
08	466,457		33	496,373	
09	427,098		34	416,373	
1910	415,936	426,000	1935	469,859	484,000
1911	481,261		1936	493,360	
12	483,125		37	488,886	
13	464,078		38	486,686	
14	491,343		39	465,672	
1915	504,426	485,000	1940	455,159	478,000
1916	499,731				
17	506,317				
18	515,839				
19	516,213				
1920	544,458	517,000			

TABLE 9

Interstate Relations per Irrigated Acreages (Computed)

Census Years	Basin Totals	Colorado Portion Acres	Colorado Portion Percents	Kansas Portion Acres	Kansas Portion Percents
1889	160,357	144,858	90.3	15,499	9.7
1899	299,516	281,592	94.0	17,924	6.0
1902	324,650	300,115	92.4	24,535*	7.6*
1909	499,055	464,236	93.0	34,819	7.0
1919**	569,162	516,213	90.7	52,949	9.3
1929	618,005	557,933	90.3	60,072	9.7
1939	525,509	469,168	89.3	56,341	10.7

*Figure for 1902 covers entire basin in Kansas, and includes areas in Cimarron River Valley and areas along main river and tributaries in Kansas east of Finney County.
**Figures for 1919 from sources other than United States Census Bureau.

CROP PRODUCTION IN KANSAS

TABLE 10

Acres of Field Crops Harvested in Kansas by Divisions (From K.S.B.A. Reports: Colo. Ex. 53 App. "B," p. 8). (Vol. XVII, p. 2924)

Year	State Totals	Divisions of Kansas Eastern	Central	Western
1881	8,656,403	4,404,709	4,096,743	154,951
1885	8,765,866	4,371,783	4,213,876	180,207
1888	10,088,083	4,831,581	4,350,209	906,293
1890	8,127,011	4,035,643	3,364,542	716,826
1895	16,720,741	6,235,740	8,687,883	1,797,118
1900	16,219,416	6,142,096	8,322,523	1,754,797
1905	17,558,740	6,014,521	9,212,143	2,332,076
1910	19,164,643	5,667,339	9,719,277	3,768,027
1915	18,201,971	5,160,395	9,389,537	3,652,039
1920	21,759,497	6,284,868	10,652,051	4,822,578
1925	21,342,760	5,485,971	10,228,529	5,628,260
1930	23,567,658	5,416,559	11,000,246	7,150,853

The values of agricultural products in Kansas, shown annually for the period 1881 to 1930 in Colorado Exhibit 64, (Tr. Vol. XVII, p. 3967, App. "B," p. 11) may be summarized by decade averages as follows:

TABLE 11

Average Annual Values of Agricultural Products

Decade	All Products	Field Crops*	Other Products**
1881-1890	$131,756,300	$ 84,439,400	$ 47,316,900
1891-1900	146,108,400	87,328,000	58,780,400
1901-1910	248,597,200	158,754,500	89,842,700
1911-1920	448,500,500	316,925,700	131,574,800
1921-1931	451,435,000	291,282,500	160,152,500

*Field crops include wheat, corn, oats, rye, barley, potatoes, cowpeas, soybeans, flax, cotton, broom corn, millet, sugar beets, pinto beans, sorghums, milo, kaffir, feterita, sudan grass, alfalfa, timothy and clover, but not prairie grass.

**Other products include livestock, poultry, dairy, horticultural and other products except field crops.

TABLE 12

Values of Field Crops in Kansas by Divisions
(From K.S.B.A. Reports: Colo. Ex. 65, Tr. Vol. XVII, p. 2974, App. "B," p. 12)

Years and Decade Avgs.	Whole State	Divisions of Kansas Eastern	Central	Western
1881	$ 91,928,376	$ 47,304,270	$ 43,478,240	$ 1,145,886
1885	73,877,167	36,717,180	35,387,150	1,772,837
1888	96,113,900	49,889,490	38,512,300	7,712,110
1890	70,148,683	35,953,000	29,785,730	4,409,953
81-90*	85,576,000	42,582,000	39,557,000	3,437,000
1895	74,109,796	39,420,980	29,080,750	5,608,066
1900	113,285,386	48,274,909	57,829,850	8,180,627
91-00*	87,406,000	41,465,000	39,965,000	5,976,000
1905	158,589,054	56,748,777	81,880,702	19,959,575
1910	191,323,126	61,695,926	102,524,540	27,102,660
01-10*	158,754,000	54,828,000	85,884,000	18,042,000
1915	243,449,493	69,747,598	127,270,810	46,431,085
1920	520,696,841	158,318,571	247,960,620	114,417,630
11-20*	316,926,000	106,724,000	158,682,000	51,520,000
1925	274,781,645	101,040,235	118,533,010	55,208,400
1930	222,811,300	58,196,150	103,001,030	61,614,120
21-30*	291,283,000	86,219,000	141,382,000	63,682,000

*Values are ten-year averages for decades shown.

TABLE 13

Acres of Field Crops in Central Kansas (From K.S.B.A. Reports: Colo. Ex. 55, Tr. Vol. XVII, p. 2932, App. "B," p. 9)

	Central Division Totals	Counties Outside of Basin	Wholly or Partly in Basin	In Basin But Not on Ark. River	Counties on Channel of Ark. River
Number of Counties	37	19	18	10	8
Years					
1881	4,096,743	2,029,596	2,067,147	934,938	1,132,209
1885	4,213,876	2,001,520	2,212,356	1,001,632	1,210,724
1888	4,350,209	2,116,195	2,234,014	1,032,979	1,201,035
1890	3,364,542	1,392,527	1,972,015	975,297	996,718
1895	8,687,883	4,219,176	4,468,707	2,065,756	2,402,951
1900	8,322,523	3,958,947	4,363,576	2,069,959	2,293,617
1905	9,212,143	4,364,584	4,847,559	2,346,343	2,501,216
1910	9,719,277	4,572,765	5,146,512	2,543,606	2,602,906
1915	9,389,537	4,553,310	4,836,227	2,453,410	2,382,817
1920	10,652,051	5,004,061	5,647,990	2,802,029	2,845,961
1925	10,228,529	4,524,870	5,703,659	2,808,852	2,894,807
1930	11,000,246	5,160,295	5,839,951	2,885,243	2,954,708

Values of field crops grown in the counties of Central Kansas, shown by years in Colorado Exhibit 66, (Tr. Vol. XVII p. 3980 App. "B." p. 13) are summarized in the following:

TABLE 14

Values of Field Crops in Central Kansas by County Groups

	Counties Outside of Basin	Wholly or Partly in Ark. River	In Basin But Not on Ark. River	Counties on Channel of Ark. River
Number of Counties	19	18	10	8
Years				
1881	$ 18,543,060	$ 24,935,180	$ 10,703,750	$ 14,231,430
1885	17,152,170	18,234,980	8,023,930	10,211,050
1888	19,347,990	19,164,310	8,690,940	10,473,370
1890	12,216,560	17,569,170	8,699,520	8,869,650
81-90*	18,449,700	21,107,400	9,737,200	11,370,200
1895	12,667,290	16,413,460	8,120,039	8,293,421
1900	25,169,420	32,660,430	15,803,630	16,850,680
91-00*	17,842,000	20,676,200	9,904,800	10,771,400
1905	39,745,608	42,135,094	19,566,217	22,568,877
1910	51,129,810	51,394,730	25,931,380	25,463,350
01-10*	40,271,000	45,613,000	22,139,700	23,473,300
1915	66,336,960	60,933,850	31,186,080	29,747,770
1920	129,620,640	118,239,980	55,992,330	62,247,650
11-20*	72,953,000	85,719,000	42,105,000	43,614,000
1925	44,804,530	73,728,480	35,124,580	38,603,900
1930	51,014,760	51,986,270	25,443,380	26,542,890
21-30*	63,743,000	77,639,000	38,506,000	39,133,000

*Values are ten-year averages for decades shown.

Summarized from Colorado Exhibit 68, (Tr. Vol. XVIII, p. 3003; App. "B," p. 15) the per acre values of field crops produced in the counties of Central Kansas by decades, were as follows:

TABLE 15

Summarized

Per Acre Values of Field Crops of Central Kansas

	1881-90	1893-00	1901-10	1911-20	1921-30
State of Kansas 105 Counties	$9.32	$5.08	$8.84	$15.70	$13.26
Eastern Division 37 Counties	9.55	6.05	9.20	17.95	15.35
Central Division 37 County Totals	$9.19	$4.75	$9.25	$15.37	$13.33
19 Outside Counties	8.89	4.59	9.16	14.90	12.83
18 Inside Counties	9.45	4.91	9.34	15.80	13.77
10 Off-Channel	9.27	5.00	9.34	15.60	13.70
8 On River Channel	9.63	4.84	9.34	15.90	13.83

In 1930 there was, in the eight counties in Central Kansas on the Arkansas River, more than 2,900,000 acres of land devoted to the production of field crops (Table 13, p. 94, appendix "(A)"; in the five counties of Western Kansas on the Arkansas River there are approximately 1,200,000 acres producing field crops (Table 16, p. 96, appendix "(A)"; and in addition to the more than 4,100,00 acres of field crops in the Kansas counties crossed by the Arkansas River, there was equal or greater acreage in adjoining counties that, wholly or in part, are located in the basin of the Arkansas River and are drained by its tributaries.

TABLE 16

Acres of Field Crops in Western Kansas
(From K.S.B.A. Reports: Colo. Ex. 57, Tr. Vol. XVII, p. 2943, App. "B," p. 10)

Number of Counties	Western Kansas Totals 31	Counties Outside of Basin 17	Wholly or in Part In Basin 14	in Basin But Not on Channel 9	Counties on Ark. River Channel 5
Years					
1881	154,951	118,706	36,245	32,405	3,840
1885	180,207	131,991	48,216	32,822	15,394
1888	906,293	625,658	280,635	193,420	87,215
1890	716,826	476,401	240,425	150,398	90,027
1895	1,797,118	1,272,282	524,836	335,487	189,349
1900	1,754,797	1,305,698	449,099	290,063	159,036
1905	2,332,076	1,601,237	730,839	456,716	274,123
1910	3,768,027	2,588,281	1,179,746	600,734	579,012
1915	3,652,039	2,539,329	1,112,719	542,547	570,172
1920	4,822,518	3,209,122	1,613,456	815,461	797,995
1927	5,628,260	3,642,228	1,986,032	1,099,984	886,048
1930	7,150,853	4,335,617	2,815,236	1,628,655	1,186,581

In the 5 main-river counties of Western Kansas, wherein the total acreages devoted to field crops in 1905 had attained a total of 274,000 acres, expansion has occurred since 1905 to an extent such that field crop acreages totalled 579,000 acres in 1910; 798,000 acres in 1920; and 1,187,000 acres in 1930.

Values of the field crops grown in Western Kansas and in the county-groups of that division, reported annually by the Kansas Board of Agriculture, and shown in Colorado Exhibit 67, (Tr. Vol. XVIII, p. 2989, App. "B," p. 14), are summarized in the following:

TABLE 17

Values of Field Crops of Western Kansas

Years	17 Counties Outside of Basin	14 Counties Wholly or in Part Inside	9 Counties in Basin Not on Channel	5 Counties on Channel Ark. River
1881	$ 661,155	$ 484,731	$ 440,217	$ 44,514
1885	1,181,037	591,800	386,757	205,043
1888	5,467,330	2,244,780	1,466,600	778,180
1890	2,209,030	2,200,923	1,203,448	997,475
81-90 avg.	2,274,000	1,163,000	735,000	428,000
1895	3,822,672	1,785,394	1,064,818	720,576
1900	5,263,004	2,917,623	1,659,746	1,257,877
91-00 avg.	3,937,600	1,806,900	1,028,000	778,900
1905	14,453,535	5,506,040	3,186,113	2,319,927
1910	17,086,210	10,016,450	4,264,221	5,752,229
01-10 avg.	12,404,900	5,637,500	2,780,600	2,856,900
1915	31,805,450	14,625,635	6,971,434	7,654,201
1920	80,804,820	33,612,830	17,627,000	15,985,830
11-20-avg.	35,021,100	16,498,400	7,535,100	8,963,300
1925	36,149,900	19,058,500	8,720,250	10,338,250
1930	39,517,860	22,096,260	12,046,060	10,050,200
21-30 avg.	38,852,800	24,829,400	12,544,000	12,285,400

Annual values per acre of field crops of Western Kansas, compiled from reports of the Kansas State Board of Agriculture, and shown as decade averages in Colorado Exhibit 68, (Tr. Vol. XVIII, p. 3003, App. "B," p. 15), are summarized in the following:

TABLE 18

Annual Value Per Acre of Field Crops of Western Kansas

	1881-90	1893-00	1901-10	1911-20	1921-30
State of Kansas 105 Counties	$9.32	$5.08	$8.84	$15.70	$13.26
Eastern Division 37 Counties	9.55	6.05	9.20	17.95	15.35
Central Division 37 Counties	9.19	4.75	9.25	15.37	13.33
Western Kansas 31 Counties	7.62	3.26	6.65	13.00	11.10
17 Outside Counties	7.10	3.17	6.66	12.94	10.60
14 Basin Counties	8.89	3.48	6.61	13.10	12.00
9 Off-Channel Counties	8.69	2.99	5.46	11.93	10.80
5 River Counties	9.25	4.48	8.31	14.23	13.50

The relative extent of irrigated and non-irrigated operations in the Arkansas River counties, measured in acres of field crops, may be approximated by comparing the total field crop acreages, including both irrigated and non-irrigated lands, reported by the Kansas State Board of Agriculture, with the irrigated acreages reported by the United States Census Bureau for the same counties, and the same season, as follows:

TABLE 19

Total Field Crop and Irrigated Acreages Counties of Western Kansas on Arkansas River

Season	Total Field Crop Acreages (K.S.B.A.)	Irrigated Acreages (U. S. Census; Table 7) Basin*	5 Counties**
1889	144,216	17,821	17,572
1899	154,810	19,483	18,570
1902	196,375	24,220	.....
1909	534,481	35,357	34,879
1919	781,802	46,539	41,485
1929	1,097,472	68,781	60,897

*Basin areas are exclusive of Cimarron River, but include tributary areas (as Pawnee Creek), and ground water developments (as in Scott County,—i.e., areas in counties other than five river counties.
**Counties are Hamilton, Kearney, Finney, Gray and Ford.

Unit yields are not important when viewed in the light of the agricultural statistics of the United States Census. Referring to the 1930 census it appears (Tr. pp. 3346-3347, Vol. XX) that, in the five Western Kansas counties along the Arkansas River, there were 1,186,581 acres of field crops of which about 62,000, or 5% were irrigated, whereas in the Colorado counties along the stream the total harvested acreage was 510,855 acres, of which 389,435, or 76% were irrigated.

WATER REQUIRED FOR IRRIGATION

As to the Arkansas Valley, Table 8 of Technical Bulletin 36, per Colorado Exhibit 135 (Tr. pp. 1966-1978, Vol. XII, App. "B," p. 27), the recommendations show seasonal net irrigation requirements, as follows: In Division 12, which includes Canon City, Pueblo and the upper Arkansas Valley in that vicinity, 2.1 acre-feet,—compared with about 1.3 acre-feet per Kansas Exhibit 93; Division 13; Arkansas Valley in Colorado down to the Stateline, 2.3 acre-feet,—as compared with values of 1.04 to 1.24 acre-feet, per Kansas Exhibit 93; and Division 14, Southwestern Kansas, 1.75 acre-feet,—as compared with 0.70 to 1.06 acre-feet, per Kansas Exhibit 93. (Tr. p. 1725, Vol. X).

POPULATIONS IN COLORADO AND KANSAS BASINS

The populations of counties along the Arkansas River in Colorado and in Kansas, cited by this court in its opinion and decree of 1907 for the years 1880, 1890 and 1900, are repeated for these years and shown for subsequent census years in the following:

TABLE 20

Populations of Counties Along Arkansas River In Colorado and in Kansas

(As Reported by United States Census Bureau)

	1880*	1890*	1900*	1910	1920	1930	1940
Fremont	4,735	9,156	15,636	18,181	17,883	18,896	19,742
Pueblo	7,617	31,491	34,448	52,223	57,683	66,038	68,870
Otero (1889)	.....	4,192	11,522	20,201	22,623	24,390	23,571
Crowley (1911)	.....	.....	.....	.....	6,383	5,934	5,398
Bent	1,654	1,313	3,049	5,043	9,705	9,134	9,653
Prowers (1889)	.....	1,969	3,766	9,520	13,845	14,762	12,304
Colorado Group	14,006	48,121	68,421	105,168	128,122	139,154	139,538
Hamilton	168	2,027	1,426	3,360	2,586	3,328	2,645
Kearney	159	1,571	1,107	3,206	2,617	3,196	2,525
Finney (1884)	.....	3,350	3,469	6,908	7,674	11,014	10,092
Gray (1887)	.....	2,415	1,264	3,121	4,711	6,211	4,773
Ford	3,122	5,308	5,497	11,393	14,273	20,647	17,254
Western Kansas	3,449	14,671	12,763	27,988	31,861	44,396	37,289
Edwards	2,409	3,600	3,682	7,033	7,057	7,295	6,377
Pawnee	5,396	5,204	5,084	8,859	9,323	10,510	10,300
Barton	10,318	13,172	13,784	17,876	18,422	19,776	25,010
Rice	9,292	14,451	14,745	15,106	14,832	13,800	17,213
Reno	12,826	27,079	29,027	37,853	44,423	47,785	52,165
Sedgwick	18,753	43,626	44,037	73,095	92,234	136,330	143,311
Sumner	20,812	30,271	25,631	30,654	29,213	28,960	26,163
Cowley	21,538	34,478	30,156	31,790	35,155	40,903	38,139
Central Kansas	101,344	171,881	166,146	222,266	250,659	305,359	328,678
Kansas Group	104,793	186,552	178,909	250,254	282,520	349,755	355,967

*Figures for years cited by Court in opinion (*Kansas v. Colorado*—1907).

A second source of information, concerning conditions in the counties of Kansas, appearing in the record as Colorado Exhibits Nos. 43 to 71, (Tr. Vol. XVII and XVIII, pp. 2858 to 3027, App. "B," p. 3-18), are the Biennial Reports officially published by the Kansas State Board of Agriculture.

Of the 105 counties comprising the State of Kansas, 37 are in the Central Division, and 31 are in the Western Division of that state; and of its total area of 82,113 square miles, the Eastern Division involves 27.9 percent, the Central Division 38.6 percent, and the Western Division 33.6 percent thereof. Of the 37 counties in the Central Division, 19 are wholly outside, and 18 are located wholly or in part in the Arkansas River basin; and of these 18 counties, 8 are crossed by the river channel, the names of which appear in the foregoing Table. Of the 31 counties in the Western Division, 17 are outside, and 14 are wholly or in part within the Arkansas River basin; and of these, 5 are crossed by the river channel, the names of which also appear in the foregoing Table.

Arranged in accordance with the three divisions of the state, the populations of Kansas, reported annually by the Kansas State Board of Agriculture as shown in Colorado Exhibit 44, (Tr. Vol. XVII, p. 2858, App. "B," p. 4), are summarized in the following:

TABLE 21

Populations State of Kansas by Divisions

	State Totals	Divisions of Kansas		
		Eastern	Central	Western
Number of Counties	105	37	37(a)	31(b)
Land Areas (Sq. Mi.)	82,113(c)	22,789	31,700	27,634
% of State Area	100	27.8	38.6	33.6
Year				
1881*	925,075	549,705	349,866	25,504
1885	1,268,530	708,861	518,400	41,269
1888**	1,518,552	760,605	621,222	136,725
1890	1,423,485	774,384	548,009	101,092
1895	1,334,734	757,039	501,124	76,571
1900	1,444,708	825,138	539,321	80,249
1905	1,544,968	885,565	565,498	94,085
1910	1,696,361	921,479	639,357	135,525
1915	1,672,545	911,829	635,046	125,670
1920	1,779,936	930,407	698,823	150,706
1925	1,812,986	944,128	705,268	163,590
1930	1,851,024	962,954	720,225	177,845

(a) Includes 8 counties on channel of Arkansas River and 10 other counties wholly or in part in Arkansas River Basin.
(b) Includes 5 counties on channel of Arkansas River and 9 other counties wholly or in part in Arkansas River Basin.
(c) Formerly reported at 82,030 square miles.
*First year of Kansas State Board of Agriculture Reports.
**Approximate peak of land-boom of 1880 decade.

TABLE 22

Populations of Counties of Western Kansas
(From K.S.B.A. Reports: Colo. Ex. 49, Tr. Vol. XVII, p. 2877, App. "B," p. 6)

Number of Counties	Western Kansas Totals	Counties Outside of Basin	Wholly or in Part in Basin	In Basin But Not on Channel	Counties on River Channel
	31	17	14	9	5
Years					
1881	25,504	17,804	7,700	3,932	3,768
1885	41,269	26,040	15,229	7,864	7,365
1888	136,725	84,204	52,521	29,076	23,445
1890	101,092	69,154	31,938	16,498	15,444
1895	76,571	51,908	24,663	12,368	12,295
1900	80,249	55,587	24,662	11,896	12,766
1905	94,085	63,207	30,878	15,514	15,364
1910	135,525	87,664	47,861	19,850	28,011
1915	125,670	79,988	45,682	18,271	27,411
1920	150,706	95,976	54,730	23,016	31,714
1925	163,590	102,760	60,830	26,822	34,008
1930	177,845	105,943	71,902	28,863	43,039

TABLE 23

Populations Central Division State of Kansas
(From K.S.B.A. Reports: Colo. Ex. 46, Tr. Vol. XVII, p. 2867, App. "B," p. 5)

Number of Counties	Central Division Totals	Counties Outside of Basin	Wholly or Partly Inside	In Basin But Not on Ark. River	Counties on Channel of Ark. River
	37	19	18	10	8
Years					
1881	349,866	183,713	166,153	76,579	89,574
1885	518,400	248,264	270,136	120,456	149,670
1888	621,222	283,574	337,648	147,288	190,360
1890	549,009	253,224	294,785	126,106	168,678
1895	501,124	232,720	268,404	115,732	152,672
1900	539,321	250,190	289,131	126,742	162,389
1905	565,498	255,222	310,276	130,481	179,795
1910	639,357	271,783	367,574	144,419	223,155
1915	635,046	272,540	362,506	142,908	219,598
1920	698,823	270,520	428,303	169,130	259,173
1925	705,268	268,719	436,549	159,243	277,306
1930	720,225	262,269	457,956	157,852	300,104

Population of Finney County, Kansas, where the largest irrigated area is situated, as reported annually by the Kansas State Board of Agriculture, and as shown by Colorado Exhibit 52, (Tr. Vol. XVII, p. 2909, App. "B," p. 7) is summarized in the following:

TABLE 24

Population of Finney County, Kansas

Years	Five River Counties	Finney County — County Totals	City of Garden City	Irrigated Townships*	All Other Portions**
1881	3,768	708			
1885	7,365	1,240	378	238	624
1888	23,445	7,386	2,819	927	3,640
1890	15,444	4,064	1,469	878	1,717
1895	12,295	3,529	1,506	950	1,073
1900	12,766	3,214	1,544	801	869
1905	15,364	3,204	1,267	787	1,150
1910	28,011	7,701	3,718	1,937	2,050
1915	27,411	6,016	3,016	1,462	1,638
1920	31,714	7,736	3,887	1,787	2,162
1925	34,008	8,293	4,099	2,091	2,103
1930	43,039	10,974	6,148	2,309	2,517

*Populations of Sherlock and Garden City Townships, in which are located substantially all the irrigated lands of Finney County, but which include, also, some areas of non-irrigated lands. The City of Garden City is surrounded by irrigated lands.

**Populations of all other portions of Finney County are located largely on non-irrigated lands, though minor irrigated areas may be included therein.

WATER RESOURCES IN KANSAS BASIN.

The flow of the Arkansas River from Kansas into Oklahoma (exclusive of the flows of tributaries entering in Oklahoma, including the Cimarron River, and the Verdigris and Neosho-Grand Rivers that together discharge about 4,000,000 acre-feet annually from Kansas into Oklahoma) averaged 1,703,414 acre-feet annually during 1922 to 1931 (Tr. pp. 5759-5780, Vol. XXXII). In this same period the Arkansas at Garden City discharged an average of 191,982 acre-feet per year (Tr. p. 5779, Vol. XXXII), indicating a net gain averaging 1,511,432 acre-feet per year. Rainfall and runoff conditions during the 10-year period were above average. The flow of the Arkansas River, averaging 171,000 acre-feet annually at Garden City, upon arrival at the Kansas-Oklahoma Stateline, has increased to an average of over 1,500,000 acre-feet annually. Since there are uses of the ground waters prior to the discharge of their surplus quantities into the river channel, and since there are conveyance losses between Garden City and the Oklahoma Stateline, due to evapora-

tion and transpiration from the river channel and adjoining bottom lands, the total water resources produced in the basin in Kansas below Garden City are materially greater than in the indicated net river gain averaging about 1,330,000 acre-feet annually.

Bottom lands in all counties of Kansas crossed by the Arkansas River are underlain, at varying but usually shallow depths, with generally abundant supplies of ground waters. In the Central Kansas counties, such bottom lands are not commonly irrigated, whereas in the Western Kansas counties the bottom lands, where soils are suitable for cultivation, are more largely irrigated, either by ditches diverting from the river, or by means of wells and pumps, or both in combination. Such irrigation also extends to and includes some of the uplands (Tr. pp. 5320-5323, vol. XXX).

The combination resource of suitable soils and abundant ground water resources at shallow depths is, as yet, largely undeveloped. Colorado's witness C. L. Patterson testified (Tr. p. 2905, vol. XVII), that irrigation possibilities in Kansas are enormous; that, if developed, Kansas will have a greater irrigated acreage than is possible of attainment in the entire State of Colorado; and, that development of irrigation in Kansas is a matter, in addition to the availability of soil and water resources, that involves balancing the needs for and benefits of irrigation, against the costs of construction and operation of the required facilities. The witness Knapp, as Irrigation Commissioner for Kansas, in his report of 1920-1922 to the Kansas State Board of Agriculture said: (Tr. p. 5412, vol. XXX)

> "The present extent of irrigation in Kansas gives little indication of the irrigation possibilities of the State. The existence of abundant supplies of ground water in many parts of the State, together with the uniformly beneficial results obtained where irrigation is now practiced, indicates that as population increases, as land values become higher, and as the value of ir-

rigation becomes more generally appreciated, the acreage will be greatly increased."

Among other of the state's promotional activities, were the installation and operation of demonstration pumping plants. At times, practically the entire time of his department has been spent on such work (Report of 1924-1926; Tr. p. 5415, vol. XXX). Stating that the biennium 1924 to 1926 had been outstanding in the development of pump irrigation, and that the work had brought out a number of interesting things, Mr. Knapp said:

> "As a means of providing a water supply to insure crops against the injurious effects of irregularly occurring drouths in a region such as this (The State of Kansas), pump irrigation is better adapted to the situation than other methods, in that it is cheaper, and comes nearer meeting the requirements of an irrigation enterprise in the semi-humid belt than would great ditch systems such as those in the West."

Among other advantages of pump irrigation, cited by the witness Knapp, are the following: pumped water costs but little, if any, more than maintenance and operating charges under a river ditch furnishing its water users a dependable supply of water (Tr. p. 5418, vol. XXX); the pumping plant provides an adequate water supply which can be made available on short notice, whereas the long canal functions best under continuous use, but conditions in the Great Plains region are such that continuous operation is not required nor even desirable, for during a considerable portion of the crop growing season natural precipitation is sufficient for the needs of crops (Tr. p. 5419, vol. XXX); the pumping plant can set unused for long periods of time, and when idle requires little or no maintenance, whereas an irrigation canal requires constant maintenance, — an item of expense which must be met whether the canal is in use or not, and a charge to be figured on during a wet year as well as a dry year, because the problem of keeping a canal free from weeds and ready to operate is a bigger one in a wet season when that

canal is not carrying water than when it is (Tr. p. 5420, vol. XXX); and by the use of a pumping plant the farmer enjoys complete independence in the use of water, while under a ditch each man must take his water when his turn comes, in many instances when he is not ready for it. (Tr. Vol. XXX. p. 5421)

Underground water resources of and along the Arkansas River in Kansas are extensive. Such resources along the river section between the Colorado Stateline and Garden City first began to be developed, in a major way, during the period of the original *Kansas v. Colorado* case. The federal government aided in the development, among other ways, through the Slichter investigations (Tr. p. 3520, Vol. XXI) and report on ground water resources; and through the construction by the United States Reclamation Bureau of the Deerfield pumping project for and in behalf of the Kansas Farmers ditch of the Finney County Water Users' Association. This project, though rejected by its beneficiaries after about two years of operation in the seasons of 1909 and 1910 (Tr. pp. 3520-3530, Vol. XXI), has recently been revived and again placed in operation. (Tr. p. 7055, Vol. XXXIX). In the meantime numerous farmers have installed individual pumping plants, which furnish irrigation supplies when and as needed at costs similar to those encountered under gravity ditches, and commonly less than are involved under ditch irrigation where reservoir costs are a part of the total.

Out of a total in the entire State of Kansas of 99,980 acres irrigated in 1939, counties in the Arkansas River basin, including Scott County, but exclusive of areas in the Cimarron, Smoky Hill, Republican and other stream basins in Kansas, embraced 94,064 acres or 94 percent of said total (Census Bureau Report).

Among the recent developments is the one in Scott County, where ground waters are found at depths of 40 to 60 feet or more, previously thought to be beyond the limits of successful pumping for general agricultural purposes. U. S. Census data shows 150 acres irrigated in 1909;

3,047 acres in 1919; 3,432 acres in 1929; and 13,389 acres in 1939 (Colorado Exhibit 196, Tr. vol. XXXVII, p. 6551; App. "B," p. 47-51).

South of the Arkansas Valley in Western Kansas is another disappearing stream, namely, Bear Creek (Colorado Exhibit 205, Tr. vol. XXXVII, p. 6607; App. "B," p. 59), draining an area of 1,580 square-miles, of which 950 thereof are in Colorado. At times of intense rains over its catchment area, floods occur in Bear Creek which, upon arrival at the sand-hills, disappear at a point south of Lakin, Kansas. Disappearance is due in part to evaporation and in part to absorption and percolation into the sands. These percolating waters, like the rainfall on the sand-hills, contribute to the ground water resources of the Arkansas River Valley.

The relations between rainfall and ground water levels are described by Kansas Irrigation Commissioner Knapp, at page 31 of his 1920-1922 Report to the Kansas State Board of Agriculture, who testified therefrom (at Tr. pp. 5320-5323, vol. XXX) as follows:

> "The water supply of the lower Arkansas valley presages a much greater irrigation development than is evidenced by the present irrigated acreage. That broad valley, widening as it does to almost a level plain, which includes the Rattlesnake and Ninnescah, small tributaries of the Arkansas River, is, for the most part, underlaid with an abundant supply of water. In many respects it is one of the best-watered valleys in the state. The depth to water is not great, varying from ten to twenty feet below the surface. Under these conditions, pumping plants are comparatively inexpensive. Distance to market here is short. The seasons are long, and a great variety of crops can be grown."
>
> . . . . . .
>
> "Whenever ground water is used for irrigation the question of the adequacy of the supply invariably

rises. A study of the water supply of this valley leaves little room for apprehension. The water-bearing stratum, composed of sand and gravel, is in effect a large storage reservoir. Considering the fact that the river, which naturally flows in the lowest part of the valley, acts as a drain to carry off surplus ground water, it is evident that this reservoir must be full to overflowing whenever there is running water in the river. No one would expect to use water from an ordinary storage reservoir without lowering the water surface, and the mere fact that the ground-water elevation drops during the irrigation season is no cause for alarm. The real test is whether or not the water supply of the valley is sufficient to fill the subterranean reservoir each year during the non-irrigating season. It not only does this, but each year more than a million acre feet of water flows out of this valley on its way to the ocean."

During the 1890 decade the ditches of Western Kansas were largely useless and of little value. Early in 1890 the Garden City ditch and the Kansas Farmers ditch were sold to a company known as the Garden City Irrigation Company, the owners of which also acquired the Southwestern Irrigation Company and its ditch now known as the Great Eastern. All three ditches were thereafter operated by Superintendent F. W. Denny (Tr. p. 3462, vol. XX) during the seasons of 1890 to 1894. Irrigated acreages which had expanded during the years of the 1880 decade began to decline in 1889. For example: Under the Kansas Farmers ditch 150 acres were irrigated in 1882; from 2,000 to 3,000 acres in 1883; from 3,000 to 4,000 acres in 1884; between 4,000 and 5,000 acres in 1885; 5,000 acres from 1886 to 1888; and 4,000 acres in 1889 (Tr. p. 3467, vol. XX). After several years of Denny management the said irrigation companies became bankrupt and went into receivership. Similiar plans prevailed at the time under other ditches including those now known as the South Side and Amazon (Tr. p. 3496, vol. XXI), located upstream in Kearney County. In 1894 Mr. Thos. E. Dewey was appointed

receiver, taking charge on June 1, 1894, though his official appointment as receiver of the Southwestern Irrigation Company was dated September 29, 1894 and of the Garden City Irrigation Company was dated July 10, 1894. Mr. John E. Edwards was made superintendent of all three ditches (Garden City, Farmers and Great Eastern), and acted in that capacity during the seasons of 1894 and 1895 (Tr. p. 3502, vol. XXI). In 1895 all three ditches were cleaned out, and their dams and headgates were reconstructed. Little, if any, irrigation was then being accomplished. Farmers were refusing to buy water, some were plowing up their irrigation laterals, while others instituted suits against the companies. (Tr. p. 3503, vol. XXI). The receiver reported that in 1896 but one flood came down the river, that no attempt was being made by him to operate the ditches, that the services of superintendent Edwards had been dispensed with, and that his efforts as receiver were being directed solely to the sale of the ditches (Tr. p. 3504, vol. XXI). During the three years 1897, 1898 and 1899, receiver Dewey attempted to lease each of the ditches to some one farmer thereunder, holding the one farmer responsible for the collection of payments from his neighbor water users. No one leased the Great Eastern ditch. Mr. C. E. Sexton leased the Kansas Farmers ditch for $2,000 per season, but made only one payment in the three years. In 1899 the total acreage irrigated under the Kansas Farmers ditch was 1,000 acres (Tr. p. 3505, vol. XXI). During 1900 and 1901 receiver Dewey made no effort to operate any of the ditches either directly or by lease, and stated that if any operation was carried on it was done by some individual farmer or group of farmers without his knowledge. From the physical standpoint the several ditches of Western Kansas as of the year 1900 were in fact largely useless (Tr. p. 3505, vol. XXI). Little value was assigned to the water rights and the irrigation facilities at the time. The 12th U. S. Census Report, for the year 1900, contains the following (Tr. p. 3506, 3507, vol. XXI):

"The history of irrigation in Kansas has been marked by a number of disastrous failures, most of them resulting from a lack of knowledge of the climatic oscillations in the sub-humid regions and from a fever of speculations in western mortgages. During a cycle of wet years agriculture was extended far into the plains region. The movement westward was greatly facilitated by companies which were formed to place loans and to take mortgages on real estate, the funds being obtained from the east. As long as the rainfall continued abundant, the profits of these loan agencies were great, and the competition became so keen that ordinary prudence was thrown aside. When a series of dry years came and crops failed season after season, the land owners abandoned their farms, leaving whole counties practically deserted. The loan companies foreclosed their mortgages and became possessors of large tracts of land, which were comparatively valueless. In order to make their property marketable, the corporations organized new companies, sold stock, and in the southwest part of the state (referring to the State of Kansas) constructed some of the largest irrigation canals in the United States. These ditches and canals have never given adequate returns upon the large investments, owing to the fact that no study had been made of the volume of water in the streams, or of any of the important conditions relating to the diversion of water from them."

"The water supply for most of these ditches was to have been taken from the Arkansas River, but it proved wholly inadequate for that purpose, and hundreds of miles of ditches had to be abandoned. The principal irrigated areas are along this river, where conditions are somewhat similar to those along the Platte River in Nebraska. Its broad, shallow channel is dry for a considerable part of the year; water, however, is seeping beneath the surface of the valley lands, as well as under the stream bed. The ditches operated at the present time can receive water only

at times of flood, and are utilized largely in the cultivation of forage crops."

When about 1890 the irrigation ditches then constructed in Western Kansas were confronted with problems and difficulties arising from an absence of surface flows in the Arkansas River, they requested assistance from the federal government in connection with the development of underground supplies. After the plan then proposed, of building so-called underflow ditches, had failed, the United States Geological Survey, beginning in 1900, undertook an investigation of ground water resources, under the direction of Charles S. Slichter. Results of the investigations were published in 1906 in Water Supply and Irrigation Paper No. 153, entitled: "The Underflow of the Arkansas Valley in Western Kansas" (Tr. p. 3521, vol. XXI). Shortly thereafter the United States Reclamation Bureau constructed a power project and pumping plant on the river near Deerfield, under an agreement with the Finney County Farmers Irrigation Association, then owner of the Kansas Farmers Ditch, to serve the 10,677 acres of irrigable land thereunder. Construction was completed during 1906 and 1907 and the project began delivering water April 1, 1908 from batteries of wells surrounding ten pumping units. Difficulties were encountered, due to the necessity of cleaning the wells of sand. In 1908 the pumped waters were used to irrigate 4,885 acres. On November 30, 1908, a public notice was issued, showing that construction costs, originally estimated at $35.00 per acre, would actually amount to $37.50 per acre of irrigable land in the project. Operation for the 1909 season commenced April 5th. By the end of June, 75 certificates had been issued providing water rights for 6,976 acres of land. The 7,555 acre-feet of water pumped in 1909 was used on 6,545 acres of land. Operation of the project during 1908 and 1909 demonstrated that, with all the difficulties, results were fairly successful though costs were necessarily high.

"This circumstance, and the fact that rainfall is usually sufficient to secure the maturing of crops has apparently lessened the desires of the land owners for an irrigating system; and the payments of the reclamation charges, as they became due, have not been made."

"Inasmuch as the public notices that have been issued provide that no water shall be furnished in any irrigation season until the operation and maintenance charges of the previous season have been paid, the plant has been closed down and put in charge of a caretaker. Future operations will depend on the action of the settlers." (Tr. p. 3524, vol. XXI).

This Reclamation Bureau irrigation project, abandoned in 1910 by the settlers under the Kansas Farmers Ditch, by reason of their unwillingness to repay construction charges of $37.50 per acre, as opposed to original estimates of $35.00 per acre, and to pay annual maintenance and operation charges that ran about $1.00 per acre higher than original estimates (Tr. p. 3525, vol. XXI), has recently been rehabilitated and is now in operation by local interests, apparently without reimbursement to the federal treasury. The original difficulties due to sand accumulating in wells, under this and other privately constructed projects, were later overcome by improvements in well construction. And the mistake of concentrating too many wells in one restricted area, could at any time have been corrected.

During the same period of 1906 to 1910 many individuals were installing wells and pumping plants, and the United States Sugar and Land Company began sinking wells in the river valley and on the uplands in the general vicinity of the Reclamation project at Deerfield. These separated and individual types of groundwater development appear to have functioned with somewhat better efficiency and satisfaction. In the shallow-lift areas of the Garden City and similar districts they have been highly successful (Tr. p. 3527, vol. XXI). In addition to the con-

tinuous flow through the underflow conduit, the sands and gravels therein constitute a natural underground reservoir which is supplied both by rains upon the valley lands and the adjoining sand hills, and by surface flows in the river channel (Tr. pp. 3528-3530, vol. XXI).

At the present time the irrigated acreage in Hamilton, Kearney and Finney counties (Kansas), approximates 60,000 acres (Tr. pp. 6553-6562, Vol. XXXVII, pp. 6837-6839, vol. XXXVIII). Of the total area being irrigated, 3,156 acres thereof are located outside of and away from constructed ditches that divert from the Arkansas River, and 56,476 acres are located under and are irrigable from the constructed river ditches. Of these irrigable lands under ditch, 3,179 acres are supplied exclusively with ground waters by means of wells and pumps. Hence, 53,277 acres are dependent, wholly or in part, upon river water. Of this total, 24,038 acres thereof are equipped with individual pumping plants, and hence, may be irrigated with river water or well water or both. This leaves 29,239 acres without individual pumping plants. However, 6,811 acres thereof, largely under the Kansas Farmers Ditch, are located under and may obtain water from the battery of wells and pumps installed during 1906-1907 and operated during 1908-1909 by the U. S. Reclamation Bureau and thereafter abandoned until recently rehabilitated and placed in operation by local interests. Thus the total acreage dependent solely on stream flows in the Arkansas River in Hamilton, Kearney, and Finney counties aggregates 22,425 acres; and the acreage served wholly or in part with ground waters by means of wells and pumps total 37,387 acres.

There are available conservation and storage possibilities in the Arkansas basin in Western Kansas. These are described in detail in Colorado Exhibits 136-144 (App. "B," p. 28) and in testimony (Tr. pp. 3310-3325, Vol. XX).

Lake McKinnie reservoir was constructed in Kearney County, Kansas, about 1908 to a capacity of about 25,000 acre-feet, and has since operated continuously and ef-

fectively. Through capturing portions of the non-seasonal or winter stream flows and of the summer floods, which previously were unusable, wasted and without benefit, Lake McKinnie reservoir has increased the total diversions made by ditches in Kansas, has increased the acreages irrigated, and has increased the benefits to Kansas arising from the interstate stream. Other similar reservoir sites are located in Kansas, but as yet have not been developed. Among these are Bear Valley Reservoir site (Colorado Exhibits 136-138, Tr. Vol. XX, p. 3310), and others, including sites designated Kendall, West Kansas, Syracuse, Kansas-Colorado and Lake McKinnie enlargement (Colorado Exhibit 139, Tr. Vol. XX, p. 3320; App. "B," p. 28). Undiverted and unused stream flows have been and are available for capture and storage in such reservoirs, if and when constructed (Colorado Exhibit 140-144, Tr. Vol. XX, pp. 3320, 3323). During the period 1908 to 1938, the constructed ditches in Kansas diverted from the Arkansas River an average of 89,000 acre-feet annually, for direct application and storage (Colorado Exhibit 211-215, Tr. Vol. XXXVII, pp. 6646-6673; App. "B," p. 63-67). There remained an average of 171,000 acre-feet annually to flow by the Garden City station and beyond the last of the ditches in Kansas (Colorado Exhibits No. 140, Tr. Vol. XX, p. 3320, No. 193, Tr. Vol. XXXVII, p. 6509, No. 204, Tr. Vol. XXXVII, p. 6605; App. "B," pp. 54-58).

VARIABILITY OF RIVER FLOW.

Variable amounts of the stateline flows are an inherent characteristic of the situation. There is no evidence to show that the stateline flow is any more spasmodic now than under conditions prior to irrigation, or that the conditions are now different than they were when the former case was before the Court.

The amended complaint of Kansas in that case, as summarized by the Court (206 U. S. 52), contained this allegation:

"* * * by the year 1891 all the natural and normal waters and a large portion of the flood waters of the Arkansas River were so appropriated and diverted and actually applied to these dry, barren, arid, non-riparian, and non-saturated lands in the State of Colorado, said diversions increasing from year to year, as their means of diversion became more complete and perfect so the average flow of the river was greatly and permanently diminished and the normal flow of the river, exclusive of floods, was wholly and permanently destroyed, * * * and the water for the irrigation ditches in the western part of Kansas has been entirely cut off."

The Court deemed as proved:

"That there is a great variance in the amount of water flowing down the channel at different seasons of the year and in different years is undoubted; that at times the entire bed of the channel has been in places dry is evident from the testimony".

Kansas v. Colorado, 206 U. S. 46, 115.

The Master in his report here also finds:

"The character of the flow of the river in Colorado is variable from year to year and season to season and day to day, and the main river at any one point may be almost without water one day and have a flood in it the next day and the following day have practically its original condition."

(Master's Findings Fact "Second"—Report p. 5.)

The state line flow is portrayed for each day of the 31 years from 1908 to 1938, by Colorado Exhibit 208 (Tr. p. 6639, Vol. XXXVII; App. "B," p. 60), values being in cubic feet per second. Monthly and annual values in acre-feet are tabulated in Colorado Exhibit No. 204 (Tr. p. 6605, vol. XXXVII; App. "B," p. 54-58), and No. 209 (Tr.

p. 6640, vol. XXXVII; App. "B," p. 61). Stateline flows, by years, ranged from minimum values of 54,000 to 59,000 acre-feet in years such as 1917, 1918, 1932 and 1934, to maximum values approximating 800,000 acre-feet, as in 1923, and to 960,000 acre-feet, as in 1921. During the 31-year period the Stateline flow averaged 260,700 acre-feet per year.

The 260,700 acre-feet of water flowing from Colorado into Kansas, in the average year of the 1908 to 1938 period, was partially used and partially unused in Kansas. An average of 89,700 acre-feet thereof, or about one-third of the total, was consumptively used, and an average of 171,000 acre-feet, or about two-thirds thereof, was unused and flowed by Garden City and out of the irrigated region unconsumed (Colorado Exhibit 212, Tr. vol. XXXVII, p. 6651; App. "B," p. 64).

The 89,700 acre-feet of water annually used in Kansas between the Stateline and Garden City was consumed by its diversion and use incident to irrigation and storage, and by natural losses in its conveyance through the river section. Diversions for irrigation and storage averaged 84,900 acre-feet annually (Colorado Exhibit 213, Tr. Vol. XXXVII, p. 6653; App. "B," p. 65). The remaining 4,800 acre-feet of water used in Kansas represents the amount by which natural channel losses exceed tributary contributions and return flows to the river section. Natural channel losses include the consumption of water by evaporation and transpiration, as well as percolation losses incident to recharging the underground reservoir to replace waters consumed through their utilization by means of wells and pumps. Tributary inflows include both surface runoff, as from the several unnamed tributaries entering from the north side, and underground contributions, as from the sand-hill areas south of the river channel in Kansas.

The 171,000 acre-feet of unconsumed outflows passing Garden City in the average year consisted of stream flows in winter months, averaging 54,100 acre-feet per winter season; and of stream flows in summer months, averaging 116,900 acre-feet per season.

Total Stateline flows each year of the 1908 to 1938 period and segregations thereof with respect to divertibility, as compiled from Colorado Exhibits No. 209 (Tr. p. 6640, vol. XXXVII; App. "B," p. 61) and No. 211 (Tr. p. 6646, vol. XXXVII; App. "B," p. 63), are shown in the following:

TABLE 25

Flow of Arkansas River Across the Stateline From Colorado into Kansas—Period 1908-1938 (Annual Values in Acre-Feet)

Year	Totals (Colo. Ex. 209)	UNDIVERTIBLE* (Colo. Ex. 211)	DIVERTIBLE (Colo. Ex. 211)
1908	560,800	406,100	154,700
09	251,400	47,500	204,000
1910	119,400	12,000	107,400
11	107,200	5,200	102,000
12	222,700	38,300	184,400
13	115,300	10,300	105,000
14	576,500	260,600	315,900
1915	495,700	150,500	345,200
16	144,300	24,800	119,500
17	59,400	0	59,400
18	58,900	0	58,900
19	225,900	18,500	207,400
1920	199,200	8,400	190,800
21	961,400	582,500	368,900
22	93,700	0	93,700
23	800,800	298,700	502,100
24	292,600	0	292,600
1925	254,000	71,000	183,000
26	102,900	0	102,800
27	452,900	242,900	209,900
28	264,200	67,600	196,600
29	250,800	75,300	175,500
1930	205,500	12,300	193,200
31	107,200	0	107,200
32	58,500	0	58,300
33	173,000	25,800	147,200
34	54,100	3,800	50,300
1935	193,200	47,000	146,200
36	345,000	174,900	170,100
37	132,300	41,700	90,600
38	204,500	33,300	171,200
AVGE.	260,700	86,100	174,700

*Quantities in flows at rates in excess of 2,000 c.f.s.

Further segregations of the divertible Stateline flows, shown as annual values in the foregoing, as between summer seasons (Apr. to Sept.) and winter months (Oct. to Mar.), are shown in the following:

TABLE 26

Divertible Stateline Flows—Period 1908 to 1938

(Values in Acre-Feet)

(Colo. Ex. 211; Tr., p. 6646, Vol. XXXVII; App. "B," p. 63)

Year	Annual	Winter	Summer
1908	154,700	109,800	44,900
09	204,000	62,100	141,900
1910	107,400	41,900	65,500
11	102,000	59,400	42,600
12	184,400	88,700	95,700
13	105,000	82,100	22,900
14	315,900	48,700	267,200
1915	345,200	66,000	279,200
16	119,500	74,400	45,100
17	59,400	40,400	19,000
18	58,900	32,600	26,300
19	207,400	76,400	131,000
1920	190,800	81,100	109,700
21	368,900	60,400	308,500
22	93,700	57,600	36,100
23	502,100	188,000	314,100
24	292,600	189,100	103,500
1925	183,000	63,500	119,500
26	102,800	48,000	54,800
27	209,900	49,700	160,200
28	196,600	62,700	133,900
29	175,500	91,000	84,500
1930	193,200	126,200	67,000
31	107,200	69,300	37,900
32	58,300	28,200	30,100
33	147,200	26,300	120,900
34	50,300	21,200	29,100
1935	146,200	17,700	128,500
36	170,100	32,000	138,100
37	90,600	23,400	67,200
38	171,200	29,900	141,300
AVGE.	174,700	66,100	108,600

The flow of the Arkansas River across the Stateline from Colorado into Kansas consists of waters originating largely below La Junta, i.e., of floods originating in plains drainage areas tributary to the main river below La Junta, and of return flows from ditches and lands along the stretch of river between La Junta and the Stateline. Little of the stream flows above La Junta reach the Stateline, though at times, as in 1921, floods originate in foothills and plains areas above La Junta that create stream flows at rates in excess of diversion capacities of ditches above La Junta, both from melting snows in mountainous headwaters and from rains on foothills and plains drainage areas, are diverted for irrigation and storage purposes by ditches with points of diversion above La Junta.

All the stream flows passing La Junta, except the crest flows of occasional major upstream floods, are diverted and used for direct application by ditches in Colorado downstream from La Junta. Considered as averages for the period 1908 to 1938, the total flow of the Arkansas River at La Junta, including flood volumes, averaged 189,200 acre-feet annually (Colorado Exhibits No. 204 (Tr. vol. XXXVII, p. 6605; App. "B," p. 54-58), and No. 207 (Tr. vol. XXXVII, p. 6633), and diversions by ditches in Colorado below La Junta averaged 192,700 acre-feet annually (Colorado Exhibits No. 207, (Tr. vol. XXXVII, p. 6633) No. 210 (Tr. vol. XXXVII, p. 6644; App. "B," p. 62). The Stateline flow averaging 260,700 acre-feet annually (Colorado Exhibit 209, Tr. vol. XXXVII, p. 6640; App. "B," p. 61) was caused by or resulted from accretions between La Junta and the Stateline.

Return flows arriving at the Stateline originate along the Arkansas River below La Junta. Return flows reaching the river upstream from La Junta are diverted by ditches along that stretch of river. Return flows below La Junta come from the irrigated lands along the river between La Junta and the Stateline, and from waters diverted by ditches along that river section, together with diversions

made by the Ft. Lyon system at points above La Junta for the irrigation of lands below. Ditches in Colorado have rediverted and reused the increased amounts of return flows. Ditches in Kansas have benefitted from the increased return flows in Colorado, and specifically from those portions thereof which, being unconsumed in Colorado, have reached the Stateline and have entered Kansas and the ditches of that state (Tr. pp. 6643-45, vol. XXXVII). These increased return flows at the Stateline have, in fact, created a water supply usable and used by ditches in Kansas, that previously was non-existent, and its points of origin downstream in Colorado precludes its further re-diversion or depletion in that state.

Flood flows crossing the Stateline from Colorado into Kansas originate largely from the 11,604 square miles of drainage area tributary to the river section below La Junta (Colorado Exhibit 205, Tr. Vol. XXXVII, p. 6607; App. "B," p. 59). The principal tributary of the Arkansas River, namely, the Purgatoire River, enters this river section. No reservoirs have been constructed on its channel, and practically the only use of its waters for storage purposes is by means of a feeder ditch near Trinidad leading to the reservoir of the Model Project, constructed about 1908. Similar feeder ditches as Horse Creek and Adobe Creek, constructed prior to 1910, intercept portions of the flood waters from headwater areas of those tributaries, which waters, being conserved in Horse Creek and Adobe Creek reservoirs and applied to lands under the Ft. Lyon system, contribute to the return flows from that enterprise, and hence, in part, to the unconsumed return flows at the Stateline. Other tributary channels entering the river in Colorado below La Junta include Gageby, Rule, Caddoa, Mud, Limestone, Big Sandy, Buffalo, Wild Horse, Cheyenne, Two Buttes, Granada, Wolf, Clay, Willow, and dozens of other miscellaneous creeks or channels. On none of the tributaries have channel reservoirs been constructed, with two exceptions, namely, Two Buttes Reservoir controls the runoff from headwater areas

of Two Buttes Creek; and Muddy Creek Reservoir controls the runoff from headwater areas of Muddy Creek, a tributary of Rule Creek. The Muddy Creek Reservoir is substantially abandoned. Otherwise the floods from the entire tributary area below La Junta are uncontrolled and reach the main river today in the same manner and to the same extent as occurred under pre-irrigation conditions.

Considering the flows of the Arkansas River as recorded at Canon City gaging station (without adjustments for by-passed and imported quantities), the minimum, average, and maximum rates, in cubic-foot-per-second units, each year of the period 1908-1938, are shown in the following:

TABLE 27

Range in Daily Flows of Arkansas River at Canon City, Colo.

Daily Record 1908-1930 from Kans. Ex. 13; Tr. Vol. IX, p. 1434, 1931-1938; From Colo. Ex. 192, Tr. Vol. XXXVII, p. 6499—Period 1908-1938

Cubic Feet Per Second

	Min.	Avge.	Max.
1908	148	472	1,904
09	236	912	4,328
1910	210	688	3,340
11	242	884	3,490
12	300	857	4,000
13	335	593	2,060
14	330	913	4,800
1915	315	679	2,980
16	354	866	3,050
17	300	852	4,760
18	120	814	4,950
19	340	805	3,030
1920	195	869	3,930
21	210	916	4,980
22	269	710	2,940
23	242	901	3,130
24	235	837	5,260
1925	157	506	1,780
26	233	688	3,520
27	232	761	3,380
28	242	707	3,930
29	265	808	2,800
1930	266	637	2,470
31	144	374	1,390
32	167	629	3,040
33	136	539	3,110
34	151	340	1,460
1935	90	649	4,260
36	177	815	2,780
37	198	529	2,420
38	220	741	3,510
AVGE.	228	719	3,315

The least flow ever recorded in any one day was 90 cubic feet per second. Minimum flows each year ranged from 90 to 354 and average 228 cubic feet per second. Average flows at the Canon City station ranged from 340 cubic feet per second in the year of least discharge, to 916 cubic feet per second in the year of greatest total flow, and, in the average year of the period, averaged 719 cubic feet per second. Maximum stream flows at Canon City, at the crest of the snow-melt or June-rise period, ranged from 1,390 to 5,260 and average 3,315 cubic feet per second.

The monthly distribution of the flow of the Arkansas River at Canon City, average, minimum, and maximum, expressed in cubic feet per second, are shown in the following:

TABLE 28

Average Discharge of Arkansas River at Canon City
By Months: Period 1908-1938
From Acre Foot values in Colo. Ex. 204,
Tr. Vol. XXXVII, p. 6605, App. "B," p. 54-58.

(Values in Cubic Feet per Second)

Months	Avge.	Min.	Max.
January	336	247	467
February	329	230	468
March	333	178	553
April	401	155	854
May	1050	340	1932
June	2197	576	3384
July	1446	305	2508
August	882	262	1523
September	495	189	1366
October	421	184	1196
November	376	204	621
December	359	249	497
Annual	719	340	916
Summer (a)	1080	448	1432
Winter	357	232	521

(a) Months April to September inclusive.

In winter months the Canon City flows range from 232 to 521 cubic feet per second, averaging 357; and in summer months, April to September, inclusive, including the June rise, they range from 448 cubic feet per second under minimum conditions, to 1,432 cubic feet per second under the most favorable water supply conditions, and in usual seasons the average is 1,080 cubic feet per second. In the summer season from April first to September thirtieth, inclusive, a period of 193 days, the flow of the Arkansas River at the Canon City gaging station during the average season of 1908-1938, as counted from the daily record thereof (Kansas Exhibit 13 for 1908-1930, Tr. vol. IX, p. 1439; Colorado Exhibit 192, Tr. vol. XXXVII, p. 6439, for 1931-1938), exceeded given rates for the number of days, as follows:

TABLE 29

Rates (C.F.S.)	No. of Days
200	178
300	161
500	126
700	102
1,000	76
1,500	46
2,000	27
2,500	15
3,000	6

Observed and measured ranges in volume are probably greater than prevailed under virgin or natural conditions, prior to the earliest permanent settlements and the first diversions and uses of the waters of the river, which date from 1859, following the discovery of gold in Colorado in the summer of 1858. Inherent features attending the establishment of civilizations included the deforestation that accompanied mining operations and grazing by livestock interests. Together these affect the character, if not to some extent the amount, of the stream flows, by hastening the speed of runoff, thus increasing the inten-

sities of floods. By reducing the periods of absorption by soils, the contributions of precipitation to the ground waters were decreased, and thus diminished the low or base flows of the streams (Tr. p. 3376, vol. XX).

Diversions from surface flows in the Arkansas River, for purposes of irrigating lands in Hamilton, Kearney and Finney counties are now and during recent years have been greater than the diversions made during and prior to the original interstate litigation. As previously mentioned, Lake McKinnie reservoir was constructed in Kearney County and came into operation just about the time or shortly after the decree therein was entered in 1907. Diversions for storage purposes in Lake McKinnie have since been made each year from winter stream flows and summer floods to an extent, averaging about 25,000 acre-feet annually, such as to provide for releases from storage averaging about 18,000 acre-feet per irrigation season. During the period since the original interstate litigation, and since Lake McKinnie reservoir came into operation, the diversions from surface flows in the Arkansas River of all ditches in Hamilton, Kearney and Finney counties in Kansas, though varying from year to year in accordance with fluctuations in natural precipitation and runoff, have gradually increased in amount. Annual and summer (April to September) diversions in acre-feet, by years, and by six-year averages, for the period 1908 to 1938, compiled from Colorado Exhibit 213, (Tr. p. 6653, vol. XXXVII; App. "B," p. 65), are shown in the following:

TABLE 30

Diversions from Arkansas River by Ditches In Hamilton, Kearney and Finney Counties, Kansas

(Values in Acre-Feet; From Colo. Ex. 213, App. "B," p. 65)

Year	Annual	Six Year Averages	Summer Apr.-Sept.	Six Year Averages
1908	45,000		30,000	
09	93,000		80,000	
1910	57,000		45,000	
11	56,000		40,000	
12	75,000		65,000	
13	29,000	59,200	20,000	46,700
14	96,000	67,700	85,000	55,800
1915	105,000	69,700	90,000	57,500
16	82,200	73,900	41,400	56,900
17	54,300	73,600	17,100	53,100
18	69,300	72,600	26,900	46,700
19	99,000	84,300	58,500	53,200
1920	111,700	86,900	73,700	51,300
21	71,000	81,200	41,600	43,200
22	56,400	77,000	35,200	42,200
1923	116,600	87,300	93,200	54,800
16-Yr. Avge.	76,000		52,700	
1924	55,700	85,100	46,500	58,100
1925	117,500	88,200	65,000	59,200
26	78,700	82,600	47,300	54,800
27	127,800	92,100	89,400	62,800
28	85,500	97,000	40,500	63,600
29	123,400	98,100	62,000	58,400
1930	116,600	108,200	60,200	60,700
31	61,900	99,000	28,500	54,600
32	54,200	94,900	33,700	52,400
33	110,600	92,000	84,200	51,500
34	46,800	85,600	23,400	48,700
1935	102,100	82,000	85,200	52,500
36	120,200	82,600	84,000	56,500
37	69,900	84,000	55,600	61,000
1938	145,200	99,100	122,700	75,800
15-Yr. Avge.	94,400		61,800	
31-Yr. Avge.	84,900		57,100	

EFFECT OF MASTER'S RECOMMENDED DECREE.

The Master's report proposes that Colorado be obligated to deliver at the State line, for the benefit of Kansas, the quantities of water therein specified (pp. 11, 12, 15, 16, 20—Master's Report).

Under such a plan, Colorado would be required to stand, out of its share of the total supply, all the natural losses of water incident to its conveyance from the various points of origin to the Stateline, and thus to overcome a burden which nature imposed on the river and on Kansas, (Tr. pp. 3361-65, Vol. XX).

Being downstream, Kansas will in any event and inevitably receive all the so-called non-dependable stream flows —i. e., the runoff of abnormally wet years. Since total original production in Colorado including both so-called dependable and non-dependable runoff, is found by the Master as 1,240,000 acre-feet, and since the so-called dependable production is estimated by him at 1,110,000 acre-feet, the non-dependable portion, amounting to 140,000 or 190,000 acre-feet will also flow down into Kansas, in addition to the 185,000 acre-feet of dependable supply specified.

It is not certain that the said increased stream flow and water supply would be utilized in Kansas, or that the required works and facilities, to serve the claimed acres of land in Kansas (Tr. p. 1736, Vol. X), would be designed and constructed.

The Master's report proposed allocation to Colorado of 925,000 acre-feet of the so-called "average annual dependable water supply of the Arkansas River and of the stream flow of the river and its tributaries" (Master's Report, pp. 10, 12, 14, 16, 19), necessarily means that the diversions of ditches in Colorado from the Arkansas River, heretofore averaging about 1,000,000 acre-feet annually, be restricted to 925,000 acre-feet per year. By reason of reduced diversions, the return flows will necessarily decline.

The Arkansas River, in its natural condition, was a very intermittent river and frequently disappearing stream.

The character of the flow of the river in Colorado is variable from year to year and season to season and day to day and the main river at any one point may be almost without water one day and have a flood in it the next day and the following day have practically its original condition. The character of the flow of the river in Colorado is widely variable from year to year and season to season (Master's Findings of Fact "Second" and "Third," pp. 5 and 6 of Master's Report) (Supreme Court's Findings in Kansas v. Colorado, 206 U. S. 46, 115).

Records of official explorations and observations of travelers, traders and early settlers, concerning stream flow conditions along the Arkansas River prior to 1859, appearing at pages 3365-73 of the transcript, (Vol. XX), demonstrate that stream flows were intermittent and at times wholly lost.

During the period of twenty years from 1860 to 1879, stream flow conditions in the Great Plains region were observed by the numerous freighters, goldseekers, homeseekers, and livestock operators who traveled back and forth along and across the river. Observations of some have been preserved (Tr. pp. 3395-3419, Vol. XX).

As therein described, the flow of the Arkansas River, when any flow existed, consisted of occasional floods in some but not all seasons, lasting a few hours to a few days each, and, in some but only a few seasons, of more sustained but smaller flows, lasting a few days to a few weeks.

In none of the twenty years preceding the first attempts in Kansas to irrigate from the Arkansas River, was there a large continuous stream flow or a dependable supply of water. The Stateline flows from Colorado into Kansas, then as now, consisted principally of floods originating in the Colorado foothills and plains drainage areas. In some, but not all, seasons the "June-rise," from mountain runoff, may have overcome the natural channel losses and have traversed the intervening stretch of river so as to have reached Kansas in varying and depleted amounts. Large portions thereof no doubt accomplished the desert

crossing when aided by coincident plains rains and floods. Little or none survived at other times, particularly in the hotter mid-summer months when evaporation rates are maximum. Except for such varying portions of the June-rise, none of the mountain runoff at other and usual stages was of sufficient volume to progress far into the plains or to reach Kansas in any amount. (Tr. pp. 3392-3419, Vol. XX).

During the period from 1859 to 1879 numerous small ditches were constructed and operated along the Arkansas River and its tributaries in Colorado. These were located in mountain valleys and along foothills and plains sections of the main river and tributary streams near the mountains where perennial flows were found and were most readily available for diversion and use, to supply the markets created by hordes of goldseekers (Tr. pp. 3376-3392, Vol. XX). Their names, numbers, and the dates and amounts of their adjudicated water rights appear in Kansas Exhibit 2 (Tr. Vol. VI, p. 904).

Table 31.

Adjudicated Direct Flow Water Rights Arkansas River and Tributaries in Colorado With Priority Dates Senior to 1880.

(Amounts in Cubic Feet per Second).
From Kans. Ex. No. 2.

Water District	Counties-Tributaries	1860-1869	1870-1879	Combined
11	Lake and Chaffee Cos.	273.91	306.30	580.21
13	Custer County	7.84	410.10	417.94
Upstream:	Main R. and Tributaries	281.75	716.40	998.15
12	Largely Fremont Co.	405.35	17.57	422.92
14	Largely Pueblo County	182.50	25.30	207.80
17	Largely Otero County	.....	156.06	156.06
67	Bent and Prowers	.....	31.05	31.05
Main River:	Foothills and Plains	587.85	229.98	817.83
10	Upper Fountain R.	474.79	333.23	808.02
12	Misc. Fremont Co.	72.98	270.77	343.75
14	Misc. Pueblo Co.	33.50	4.10	37.60
15	St. Charles R.	75.35*	75.50	150.85
16	Huerfano R.	173.30	216.46	389.76
17	Misc. Otero Co.	.....	.....	.....
18	Upper Apishapa R.	107.99	74.75	182.74
19	Upper Purgatoire R.	257.96	169.68	427.64
67	Misc. Bent-Prowers	.....	.....	.....
Tributaries:	Entering below mountains	1,195.87	1,144.49	2,340.36
	Basin Totals	2,065.47	2,090.87	4,156.34

*Includes 2.50 cfs. dated 1859.

On each tributary stream the usual seasonal flows are greatly exceeded by the appropriations dated senior to 1880. On the Fountain River, for example, as early as 1864 thirty-seven different ditches had been constructed, in what is now El Paso County and Water District 10, with an aggregate diversion capacity of more than 300 cubic feet per second. This greatly exceeds the total flow of the stream at all times except for infrequent days when cloudbursts visit the territory. As a result, other ditches along the Fountain River lower down in Pueblo County (Water District 14), though constructed during the years 1865 to 1869, are commonly unsupplied with water, and, hence, are properly designated flood water rights, regardless of their early date (Tr. p. 3378, Vol. XX). They divert water,

during crop seasons, only at times of floods, which periodically occur in volumes greatly in excess of all constructed diversion capacities along the stream, and, hence, such floods contribute to the flow of the main stream. Tributaries similar to the Fountain River include the Purgatoire, Apishapa, Huerfano and St. Charles rivers, the mountain supplies of each of which were developed and used early in the 1860 decade. Thereafter none of the so-callled dependable supplies of such tributaries reached the parent stream, and have not been available for appropriation or use along the Arkansas River, either in Colorado or Kansas, since that time, if they ever had been prior thereto (Tr. p. 3379, Vol. XX). There were no early appropriations along plains tributaries entering in Otero, Bent and Prowers counties, such as Big Sandy, Horse Creek, Adobe Creek, Timpas Creek, and Chico Creek, which channels, except as later influenced by return flows from irrigation, have no dependable or perennial volumes, and instead are dry and wholly without water except at times of plains floods. Other miscellaneous tributaries, originating in mountainous areas, include Turkey, Beaver, Eight Mile, Four Mile, Grape, Oak and Hardscrabble creeks. The dependable summer water supply of all these streams was appropriated and used in Colorado as early as the year 1874 (Tr. p. 3380, Vol. XX).

The 1880 decade was characterized by a sequence of seasons that were unusually favorable from the standpoint of precipitation and runoff. Above average amounts of precipitation occurred generally over the Great Plains. At Dodge City, Kansas, during 1881 to 1886, the average annual precipitation exceeded 24 inches. Many plains tributaries became more or less temporarily perennial in the character of their stream flows. Snowfalls in the Colorado mountains was excessive. The years 1885 to 1886 were also unusually high water supply years. These favorable conditions continued through the season of 1887 and partly into the season of 1888, when a reversal in the climate cycle began which created drouth conditions of severe in-

tensity particularly during the period of years from 1889 to 1894 (Tr. pp. 3422-3424, Vol. XX).

Construction of ditches in Kansas for purposes of irrigation along the Arkansas River began about 1880 with the Garden City ditch in Finney County. Thereafter ditches were constructed further upstream in Kearney County, and later in Hamilton County, where, upon reaching the Colorado line, the upstream progression was halted. A total of eight ditches were constructed in three counties. Five of these were in Finney and Kearney counties, constituting the Garden City group. In the order of their construction, and in the order of their location upstream along the river, these were the Garden City, Kansas Farmers, Great Eastern, South Side, and, about 1887, the Amazon. The three ditches in Hamilton County, termed the Syracuse group, were the Ft. Aubrey, Alamo and Frontier. The progressive upstream development of irrigation in Western Kansas, under which each new ditch to be undertaken moved on to the river just upstream from the last ditch previously constructed, was brought about by the laws of the State of Kansas, or the absence of laws relating to appropriations, diversions and uses of water, and of rights of individuals in that regard. (Tr. p. 3454, Vol. XX).

At the same time, in Colorado, as stated in the opinion in the case of Kansas v. Colorado, 206 U. S. 46, 108:

> "certain corporations commenced the work of irrigation on a large scale. In 1884, work was commenced on ditches along the Arkansas River capable of carrying off 450 cubic feet per second, in 1887 others capable of carrying off 1,461 cubic feet per second; and in 1890 still others carrying 1,705 cubic feet per second. Most of these were completed within two years after the commencement of the several works."

Settlers under the recently constructed ditches in Eastern Colorado and Western Kansas in the 1880 decade experienced hardships that attracted nation-wide attention and brought about investigations by committees of Congress in answer to their appeals for aid and relief (Tr. pp.

3485-3488, Vol. XXI). Irrigation interests in Kansas applied to the federal government for aid in the development of the underflow of the Arkansas River and of the underground water resources of that state. Irrigation interests in Colorado asked the federal government to survey reservoir sites in that state, to aid them in their program of storage, which had become necessary in order to irrigate the lands under newly constructed ditches, under which floodwaters and stream flows of winter months, then being unused and wasted, would be conserved (Tr. pp. 3447, 3486, Vol. XXI).

KANSAS ROTATION AGREEMENT AND THE 1916 SETTLEMENT.

The only subsisting enterprises of any importance designed for the diversion of stream flow from the Arkansas River in Kansas consist of a group of ditches, principally in Finney County, Kansas, all within 80 miles from the state line. These are: The Amazon Canal, The South Side Ditch, The Great Eastern Canal, The Farmers' (sometimes called the Kansas or Kansas Farmers') Ditch and the Garden City Ditch. West of this group, through a distance of about sixty miles between the Kansas-Colorado boundary and the Garden City section, the river flows through a stretch of land ill adapted to profitable agriculture and always thinly populated. From the earliest times the river had practically no surface flow during this stretch, the normal flow being absorbed in the sand and even considerable floods being dissipated and lost. Two or three small ditches of comparatively minor dimensions were constructed in this stretch, mostly near the Colorado line, after various years of abandonment and reconstruction, still survive. They have been recently revived by the increase in continuous flow brought about by the return waters now rapidly developing from long continued irrigation within the boundaries of Colorado. The Garden City group already mentioned, however, represents substantially the whole of the irrigation development within the State of Kansas which has survived.

On August 30, 1908, the Finney County Water Users' Association (co-defendant in this case) brought suit in the District Court of Kearney County, Kansas (later removed to the United States Court) seeking an adjudication of priorities of all Kansas ditches diverting from the Arkansas River (Tr. Vol. XXI, pp. 3530 to 3539). This suit between the Kansas ditches was settled by a stipulation dated May 16, 1911, consenting to the entry of a decree under which the divertible waters of the Arkansas River, including the supplies expected to be acquired from the Colorado ditches in the United States Irrigating Company suit, (hereafter mentioned) were to be divided, distributed and rotated as follows:

The Garden City Ditch, 2/21, 1,500 acre feet;
The Farmers Ditch, 5/21, 3,750 acre feet;
Great Eastern Ditch, 6/21, 4,500 acre feet;
South Side Ditch, 4/21, 3,000 acre feet;
Amazon Ditch, 4/21, 3,000 acre feet.

Under the same stipulation-decree a distributing officer was appointed by the court to carry out its terms. This officer after functioning several years was later replaced by an agency of the State of Kansas.

On August 27, 1910, and after the decision in *Kansas v. Colorado*, 206 U. S. 46, which had been rendered in 1907, suit was brought in the United States Court, for the District of Colorado, by the United States Irrigating Company against The Graham Ditch Company, and numerous other public and private corporations, owners of canals and reservoirs, and water rights, in Colorado (Colo. Ex. 1, Vol. I, p. 1). Various Colorado water officials were also named as defendants, but the officials were later dismissed from the suit. The various corporations named as defendants were substantially the same as the individual defendants named as parties in the interstate case of Kansas v. Colorado.

The suit was to establish Plaintiff's rights under certain claims of priorities of appropriation of water in Kansas, and regardless of State lines as against the Defend-

ants' claim of priorities and rights on the Arkansas River. (The case was No. 5578). After presentation of Complainant's testimony and before any testimony had been introduced in behalf of the defendants, the case was settled by contract dated February 19, 1916 (Colo. Ex. 148, Vol. XXI, p. 3517) and dismissed pursuant to the settlement.

The Finney County Water Users Association, a co-defendant in the case now before the court, sought to intervene in case No. 5578 (Colo. Ex. 149, Vol. XXI, p. 3518).

(The Master's finding merely states that the case was dismissed, but makes no mention or reference to the settlement contract.)

(Spec. Master's Report, Finding of Fact "Fourth," p. 9).

The State of Kansas was not a party to the suit brought by the United States Irrigating Company, and was not a party to the 1916 settlement. The State of Kansas, however, in Paragraph Twenty-second of its separate answer in the case now before the Court alleges as part of its claim to an allocation of water from the Arkansas River in Colorado, the priorities and water rights of the Kansas ditches covered by the 1916 settlement.

The Finney County Water Users' Association, co-defendant with the State of Kansas in this case, was not a party to the United States Irrigating Company suit, and was not a party to the 1916 settlement, but has benefited from that settlement because of the rotation agreement and decree hereinabove set out.

The 1916 settlement contract provided that (a) the defendants (the Colorado canals) should recognize priorities of date August 27, 1910, in the Kansas ditches on whose behalf the United States Irrigating Company had sued, namely, the Amazon, South Side, Great Eastern and Garden City Ditches, and the Lake McKinney Reservoir; (b) the defendants should not apply for, or claim priorities for storage purposes on the Purgatoire River, or on the Arkansas River below the mouth of the Purgatoire, as of

an earlier date than August 27, 1910; (c) the defendants should pay the costs of the suit; (d) the defendants should pay the signatory Kansas interests fifty cents per acre then being irrigated in Colorado, and (e) the defendants should pay the signatory Kansas interest the further sum of $30,000. (Colo. Ex. 148, Vol. XXI, p. 3517). The Kansas interests signatory to the settlement contract agreed to accept the priority date as of August 27, 1910, and the quantities of water therein specified as settlement of their relative rights as against Colorado appropriators, and agreed to accept the payments above mentioned, totalling a sum of about $150,000. These payments have been made and accepted long since. (Tr. Vol. XXV, p. 6084). Pursuant to provisions of this settlement contract, no Colorado reservoir or storage development on the Purgatoire River, or on the Arkansas below the mouth of the Purgatoire has been made or attempted by Colorado since that date. On page 15 of the settlement contract it is stated:

> "And whereas, the development of wells and pumping plants on the lands irrigated by the ditches and canals of first parties has proven the existence of large bodies of underground waters commonly known as the underflow, which said waters are available for use in irrigating said lands, as a supplemental and further water supply, in addition to the surface flow of said river,"

(The "lands" above mentioned are the Kansas lands.) On page 20 of the settlement-contract it is stated:

> "This contract shall be upon its final execution, according to its terms, conclusive as to the legal and equitable rights to the use of water from the Arkansas River, as between the signatory parties thereto."

The Finney County Water Users' Association, having been refused permission to intervene in the United States Irrigating Company suit, and having declined to become a party to the settlement contract of 1916, itself brought suit in November, 1916, in the United States District Court, for the District of Colorado, against the Graham Ditch Com-

pany and other canals and water users in Colorado, being substantially the same defendants named in the United States Irrigating Company suit (Colo. Ex. No. 2, Vol. I, p. 9). The number of the Finney County Water Users' Association suit was 6633. The relief sought in this suit was in substance an adjudication of a priority on Plaintiff's behalf as against the Colorado water users. A few years later the same Plaintiff brought another suit (No. 7493) against the Coler Ditch and Reservoir Co., and other Colorado water users not named a defendant in its first suit (Colo. Ex. 3, Vol I, p. 11). Some testimony was taken in these cases, but hearings were discontinued upon the bringing of the present suit of the State of Colorado v. the State of Kansas and the Finney County Water User's Association. The State of Kansas in its claim for relief or cross-bill in this case (Paragraph twenty-second of Kansas answer) alleges as a claim to an allocation of water from the Arkansas River, the alleged priorities set up by The Finney County Water Users' Association in its cases in the District Court.

The Master has recommended that these private suits in the District Court should be dismissed and their further prosecution enjoined, and no exception to this has been filed.

THE 1933 STIPULATION.

In December, 1933, the States of Colorado and Kansas by their respective Governors, Attorneys General, State Engineers, and Counsel in this case, entered into a stipulation, introduced in evidence by both parties (Colorado Ex. 179, Kansas Exhibit 129, Tr. p. 6053, Vol. XXXV; App. "B," pp. 30-35). The Finney County Water Users' Association, co-defendant herein, was a party to the stipulation.

The stipulation recites (1) that the case is pending in the United States Supreme Court; (2) that the construction of the Caddoa Reservoir by the United States was under consideration; (3) that it was the thought of the parties that the reservoir would "enable much of the water that flows in said river past the location of said proposed dam to be stored, regulated and conserved for beneficial use;" (4)

that the parties "recognize the advantages" to be gained from the reservoir "if assured of the protection not only to all rights which they now have and which are involved in the present controversy, but also to their existing water supply in the event said dam" should be constructed and operated prior to the entry of a decree in the pending case; and (5) that it was desirable to provide for the co-operation of the two states and The Finney County Water Users' Association in securing the construction of the dam.

Section One expressed the promise of the parties to use their influence to obtain the construction of the reservoir and then contained this provision:

> "Said parties agree as between themselves to the allocation of the water that might be stored in said reservoir, as hereinafter set forth; it being understood that such allocation shall be subject to the storage and discharge of water stored in such reservoir by the United States of America in order to lessen or avoid damages from floods."

Section Two provided for the allocation of the water:

> "That the construction and operation of said dam and reservoir shall not disturb the status quo of the diversion of water for beneficial use from said Arkansas River by the ditches and canals now constructed and operated in both of the states of Colorado and Kansas. IT IS UNDERSTOOD AND AGREED that in order to maintain the status quo of said diversions as hereinabove referred to there shall be allocated to the State of Kansas for delivery at the Stateline in the Arkansas River from Colorado into Kansas a quantity of water up to 77,000 acre feet annually, of which amount 52,000 acre feet thereof shall be delivered at the State line during the irrigation season from April 1 to October 1 of each year as and when required by the Kansas State water officials, and 25,000 acre-feet thereof to be delivered during the non-irrigating season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for irrigation or

storage; and for irrigation of lands in Colorado below said reservoir a quantity of water up to 160,000 acre feet annually."

Section Three provided that when the river flow below the dam should be insufficient to supply the total amount allocated by Section Two, "then in that event the said waters shall be prorated between Colorado and Kansas in the relation hereinabove in paragraph 2 hereof set forth."

Section Four provides for the allocation of surplus water:

> "After the allocation of water as provided in the next preceding paragraphs, all additional water which may be impounded in said reservoir, excepting, always the amounts of water discharged for flood control purposes, hereinafter referred to, shall constitute surplus and shall be allocated one-half to Colorado and one-half to Kansas, said surplus to be determined April 1, annually, or such other date as may be mutually agreed upon by water officials of the two States, and the amount allocated to each state shall be discharged from said reservoir from time to time on request of the Water Officials of each State respectively for the water allocated to it, but the release of such water on demand shall not be considered as constituting any part of the amounts specified in paragraph 2 herein."

Section Five provides that any exchanges of water between Colorado ditches located below and above the reservoir shall be made only out of surplus and shall be charged against Colorado's share of the surplus.

Section Six states that reservoir flood releases shall not be charged against either state unless such releases coincide with a request by the state.

Section Seven makes the provisions for allocation of water effective "when such dam shall have been constructed and water begun to be stored in said reservoir."

Section Eight provides:

> "This stipulation is without prejudice to the claims of either party hereto in the above specified case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties hereto to water flowing in the Arkansas River, or stored in said reservoir."

Section Nine gives joint control of the storage and discharge of reservoir waters to the two states.

The Master finds the Stipulation to be "not binding" upon either State, nor to be considered in the adjudication of this suit. (Finding "Thirteen," Conclusion "Seven" and paragraph "Six" of proposed Decree, pp. 13, 16, 21 Master's Report.)

CADDOA RESERVOIR AND ITS UTILIZATION IN SETTLEMENT OF THIS CONTROVERSY.

During the pendency of this action and after a considerable part of the evidence on both sides had been introduced, a new element came into the picture which might affect the regulation and control of the surplus waters of the Arkansas River. This was by the construction by the Federal government of what is commonly known as the Caddoa Reservoir on the main River channel about 48 miles west of the Colorado-Kansas state line.

The Master characterizes this as of "limited life" and "a temporary achievement" (page 14, Master's Report), and "not binding upon either of said states" and "nor to be embodied in a decree in the present suit." (Master's Report, pp. 16, 21).

A description of the Reservoir and its probable operation and effect on the river flow and a plan to equitably allocate between Kansas and Colorado the use of waters made available are shown in Colorado Exhibits 207-229, (Tr. pp. 6633-6748, Vols. XXXVII and XXXVIII; App. "B," pp. 60-71).

Unused water resources and wasted stream flows crossing the state line and passing Garden City, together with needs for additional water supplies, under normal climatic conditions, to properly irrigate the lands under constructed enterprises in the Arkansas River basin in Colorado, have been the subjects of investigations heretofore and now being made by Colorado and its citizens and water users. (Tr. p. 1739, Vol. X). In brief, the said investigations disclose, first, that the water supplies of ditches with points of diversion below Caddoa are dependent, largely, on flood runoff from plains areas, and that water supply deficiencies under such ditches can best be remedied by reservoirs to control such floods, regulate the stream flows, and conserve water resources that heretofore, being unused, were wasted, and at times were damaging to lands and property along the stream channels; and, second, that water supply deficiencies under ditches upstream from Caddoa can be remedied, as a rule, only by importations of additional waters from other streams, (Tr. pp. 618-620, Vol. IV), i. e., from the headwater tributaries of the Colorado River, which originates west of the Continental Divide and flows into the Gulf of California.

Operations under the Colorado Canal system (Twin Lakes or Bob Creek Canal) with its headgate 125 miles west of the Colorado-Kansas State line proved so unsatisfactory, and the quantities of water diverted and used were so inadequate, as to cause declines in irrigated acreages and severe crop losses in all years except at intervals when large rainfall and runoff resulted in undependable water supplies. This system constructed its Colorado or Bob Creek Canal, beginning June 9, 1890; Lake Henry Reservoir in 1891, which was later enlarged in 1909; Lake Meredith Reservoir in 1898; and Twin Lakes Reservoirs in 1896 and 1897. In spite of its relatively large storage provisions, the diversions and uses of water under the system were inadequate. The Colorado Canal system undertook the construction of an importation project, involving a tunnel at Independence Pass at an expense of several million dollars, (Tr. pp. 3612-13, Vol. XXII) which will add about one acre-foot per acre to the water supplies derived from local sources. Deliveries by this importation project began in May of 1935 (Colorado

Exhibit 194, Tr. Vol. XXXVII, p. 6513; App. "B," pp. 36-41).

Investigations of the possibilities of flood control, water conservation, and importations to the Arkansas River, and of the engineering and economic feasibility of such projects, previously made by the Colorado State Engineer, in co-operation and with funds provided in part by individuals and organizations of water users in the Arkansas Valley in Colorado, include the so-called Amsley Investigations of water utilization and disposal during the years 1922 to 1925; transmountain diversion investigations as reported June 27, 1927 (Tr. pp. 3599-3622, Vol. XXII); and reservoir investigations of sites on Purgatoire River and at Caddoa on the Arkansas River, published in 24th Biennial Report (1926-1927) of the Colorado State Engineer (Tr. p. 1739, Vol. X).

With respect to flood control and water conservation possibilities in the Arkansas River basin, the investigations of the Colorado State Engineer, such as outlined in the 24th Biennial Report (Tr. p. 1739, Vol. X), covered reservoir sites, among which were Purgatoire Reservoir No. 2, on the lower Purgatoire River in Colorado; Caddoa Reservoir, on the Arkansas River in Eastern Colorado; Bear Creek, an off-channel site in Western Kansas; and others in Eastern Colorado and Western Kansas. These were again and further investigated by the War Department, U. S. Corps of Engineers, and were included in its Flood Control Report on the entire Arkansas River and its tributaries, being House Document No. 308, 74th Congress, 1st Session, printed August 24, 1935, and appearing herein as Colorado Exhibit 201-(a), Tr. Vol. XXXVII, p. 6592). When, in 1933, it appeared that construction of Caddoa Dam and Reservoir by the United States might be recommended by the Corps of Engineers, U. S. Army, and might be authorized by Congress, provided the States of Colorado and Kansas would settle the long-standing controversy between them, concerning the relative rights of the respective states in and to the use of waters of the interstate stream, the officials of the two states and counsel

for all parties herein, entered into an agreement dated December 18, 1933, referred to as the Stipulation of 1933, and hereinabove discussed.

Construction of Caddoa Dam and appurtenant works, by the War Department, Corps of Engineers, U. S. Army, was thereupon and thereafter authorized by Congress in the Flood Control Act of June 22, 1936, to provide for flood control and water conservation in Colorado and Kansas. Maintenance and operation of the project after its completion, by the Flood Control Act of 1938, was placed under the supervision of the Corps of Engineers, U. S. Army. Costs of lands, rights-of-way, damages, railroad and other relocations, and appurtenant works, declared in the 1938 Flood Control Act to be parts of the construction costs, were thereby assumed by the United States, and appropriations for construction purposes were made in the 1938 and subsequent Flood Control Acts. Construction work on Caddoa Dam began in 1940. About that time, by Act of Congress, the official name was changed to the "John Martin Reservoir Project," though for convenience the original name of Caddoa is herein retained.

General location and design plans of Caddoa Dam and Caddoa Reservoir are shown by Colorado Exhibits 198 and 199 (Tr. Vol. XXXVII, pp. 6518-6580). Project plans contemplate a reservoir, when completed, of a total capacity of about 655,000 acre-feet. (The preliminary figure mentioned in the Stipulation of 1933 was 680,000 acre-feet). About 270,000 acre-feet of the said total capacity, between elevations 3,870 and 3,851 feet, termed the flood pool, is reserved for flood control. Regulations to govern operations of the flood pool, announced by the Corps of Engineers, U. S. Army, provide that waters impounded therein, incident to flood damage prevention, will be released, without regard to then prevailing irrigation needs, at rates up to the conveyance capacity of the downstream river channel, estimated at about 10,000 cubic feet per second. (Tr. p. 6524, Vol. XXXVII.)

The said flood pool has been designed to control the greatest flood of record to within the bankful capacity of the downstream channel. This design flood occurred June

2-5, 1921, and had a crestflow at Caddoa of 170,000 cubic feet per second and a duration at that stage of about 3 hours. Flood control benefits, measured by the savings in flood damages to be prevented by Caddoa Reservoir, as determined by the Corps of Engineers, U. S. Army (Colorado Exhibit 201-a; Tr. p. 6592, Vol. XXXVII), will be:

To Colorado property	$35,990 annually; and,
To Kansas property	97,329 annually.

The remaining storage space in Caddoa Reservoir, as designed and being constructed, namely, that below El. 3,851 ft., amounting initially, prior to its reduction by siltation, to about 385,000 acre-feet (Colorado Exhibits 200, 201, Tr. Vol. XXXVII, pp. 6582-6592), termed the conservation pool, is allocated to conservation storage. No regulations with respect to operation of the conservation pool have been issued by the Corps of Engineers, U. S. Army, or any other agency.

Irrigation benefits to be derived, when Caddoa Reservoir is completed and comes into operation, are of two kinds. In the first category are those, for convenience termed regulation benefits, which involve waters historically used by ditches downstream in Colorado and Kansas, which will result from or be created through regulation, or temporary storage, by making the said waters available for use more nearly in accordance with irrigation needs. Those in the second category involve waters historically unused and wasted, that, being conserved, are to become available for additional diversion and increased use. These unappropriated waters by the Stipulation of 1933 are to be divided equally between the two states. In some seasons of above-average rainfall and runoff, the surplus supplies thus captured and conserved may be of considerable extent, whereas in other seasons of subnormal or drouth conditions there will be no surplus water impounded. (Colo. Ex. 221, 224, Tr. p. 6750, Vol. XXXVIII).

In order to understand the nature and extent of the surplus supplies and conservation benefits of Caddoa Reservoir, it is necessary, by reason of fluctuating natural conditions, to take into account a substantial period of years.

Records covering the 31-year period 1908 to 1938 have been assembled, analyzed and presented. Precipitation averages during the study period are shown by Colorado Exhibit 202, (Tr. Vol. XXXVII, p. 6602; App. "B," p. 52), the said period averages being in substantial agreement with longer time averages, such as the record of 68 years at Pueblo, and 75 years at Las Animas. Average annual temperatures during the study period are shown by Colorado Exhibit 203 (Tr. Vol. XXXVII, p. 6603; App. "B," p. 53). Stream flows by months, seasons and years, as recorded at the principal stream gaging stations of Canon City, Pueblo, La Junta, Lamar, Stateline, and Garden City, on the Arkansas River, and on the Purgatoire River are shown by Colorado Exhibit 204 (Tr. Vol. XXXVII, p. 6605; App. "B," pp. 54-58) and as calculated at Caddoa, are shown by Colorado Exhibit 207 (Tr. Vol. XXXVII, p. 6633).

Stateline flows as recorded daily are portrayed by Colorado Exhibit 208 (Tr. Vol. XXXVII, p. 6639; App. "B," p. 60), and are tabulated, as monthly, seasonal and yearly quantities in 1,000 acre-feet units, in Colorado Exhibit 209 (Tr. Vol. XXXVII, p. 6639; App. "B,", p. 61). Stateline flows originate, in part, above the site of Caddoa Reservoir, and in part below. Those originating upstream from Caddoa, and accruing in amounts not in excess of the reservoir's conservation capacity, can become subject to release as needed. Stream flows and water supplies entering below Caddoa cannot be controlled or conserved by the proposed reservoir (Tr. pp. 6642-6643, Vol. XXXVII).

Kansas Exception Number III, to the Master's Report, seeks to have this Court declare that the larger portion of the water supply passing across the state line into Kansas can be captured and conserved in Caddoa Reservoir.

Only about one-half of the Stateline flows historically recorded have passed the site of Caddoa Reservoir—portions of which are in excess of conservation capacity—and the remaining one-half entering the Arkansas River below that point, is not subject to control by Caddoa Reservoir. Relations between the Caddoa and Stateline flows, in the average year of the 1908 to 1938 period, together with average quantities diverted from and accretions to the inter-

vening river section, are summarized (from Colorado Exhibits 209, 210; Tr. Vol. XXXVII, pp. 6640-6644; App. "B," pp. 61, 62) in the following:

TABLE 32

Average Discharge of Arkansas River at Caddoa and at Stateline

Diversions and Accretions along River Section.

(Values in Acre-Feet are Averages for 1908-1938)

	Summer	Winter	Annual
Flow at Caddoa	233,100	62,600	295,700
Diversions of Colorado Ditches	117,800	41,100	158,900(a)
Balance—Undiverted	115,300	21,500	136,800
Accretions to Section	65,200	58,700	123,900(b)
Flow at Stateline	180,400	80,300	260,700

(a) Comparable with 160,000 acre-feet specified in 1933 Stipulation.
(b) Accretions below Caddoa constitute about ½ of total Stateline flow.

Accretions to the flow of the Arkansas River between Caddoa and the Stateline consist of tributary inflows and return flows. Tributary inflows are the intermittent run-off, due to periodic intense rainfalls, from the drainage area of about 5,600 square miles tributary to that stretch of river (Colorado Exhibit 205, Tr. Vol. XXXVII, p. 6607; App. "B," p. 59). Together the tributary inflows and return flows, in addition to overcoming the natural consumption or conveyance losses of the river section, are of sufficient magnitude to deliver an average of 123,900 acre-feet at the Stateline. Neither the tributary inflows nor the return flows causing the said accretions or river gains, are subject to capture, control, regulation or conservation by the proposed Caddoa Reservoir.

The said approximate half of the Stateline flows originating below Caddoa is not possible of material depletion by future operations in Colorado. The return flows, constituting a large if not a major share of the said downstream accretions, being the water supplies most largely diverted and used in Kansas, cannot be further depleted in Colorado, since they enter the river section below the points of diversion therefrom of the Colorado ditches.

Such return flows on the contrary will inevitably be increased to substantially the same extent that the diversions of the Colorado ditches below Caddoa, and of the Ft. Lyon system, are increased through operations of the proposed Caddoa Reservoir.

Stateline flows historically recorded during 1908 to 1938, as portrayed by Colorado Exhibit 208 (Tr. Vol. XXXVII, p. 6639; App. "B," p. 60) and tabulated in Colorado Exhibit 209 (Tr. Vol. XXXVII, p. 6640, App. "B," p. 61) are in part undivertible by constructed ditches in Kansas. At times of plains floods the Stateline flows occur at rates in excess of 2,000 cubic feet per second, which is the approximate aggregate diversion capacity of the Kansas ditches. Segregations of the historic Stateline flows according to divertibility, and with respect to the quantities used and unused in Kansas (summarized from Colorado Exhibits 211 to 215 Tr. Vol. XXXVII, pp. 6646-6675; App. "B," pp. 63-67), are shown in the following:

Table 33.

Divertible and Undivertible Stateline Flows
Quantities Used and Unused in Kansas.

(Values in Acre-Feet are Averages for 1908-1938)

	Summer	Winter	Annual
Total Stateline Flow	180,400	80,300	260,700
Undivertible Flood Crests (a)	71,800	14,300	86,100
Divertible by Kansas Ditches	108,600	66,100	174,700
Diverted in Kansas	57,100	27,800	84,900
Accretions to Garden City	—6,400	1,600	—4,800
Divertible Water Used (b)	63,500	26,200	89,700(b)
Divertible Water Unused	45,100	39,900	85,000
Undivertible, Unused	71,800	14,300	86,100
Unused Garden City Outflow	116,900	54,100	171,000

(a) Flows at rates in excess of 2,000 c.f.s. classed as undivertible by constructed ditches in Kansas.

(b) As of Stateline: Includes Holly drain water (in part used by Frontier ditch), and, except for on demand provision of 1933 Stipulation, is comparable with 77,000 acre-feet therein specified as status quo allocation to Kansas.

As indicated by Table 33, the total uses of Arkansas River water heretofore made in Western Kansas, between

the Stateline and Garden City, by diversions from the river channel, by means of wells and pumps, and to satisfy conveyance losses, together have been equivalent to about one-third of the stream flows crossing the Stateline. Another one-third may be considered undivertble. The remaining third, though divertible, has not been used. So that two-thirds of the total Stateline flow, being unused, and having been permitted to flow past Garden City, has been wasted and without benefit. Excluding the so-called undivertible stream flows, approximately one-half of the divertible water supplies entering Kansas have been unused and wasted, because sufficient storage capacity has not been provided in Kansas. (Tr. p. 6652, Vol. XXXVII).

Except for the construction of Lake McKinnie Reservoir in 1906-1907, throughout the period from the original to the pending interstate litigation, the reservoir sites and opportunities in Western Kansas have remained undeveloped.

Tests of the percents of silt in suspension in various stages of the flow of the Arkansas River at the site of Caddoa Reservoir (Colorado Exhibit 216, Tr. Vol. XXXVIII, p. 6682), indicate that siltation and loss of storage capacity will occur at the rates or in the relations indicated by Colorado Exhibit 217, (Tr. Vol. XXXVIII, p. 6686). Had the reservoir functioned during the period 1908 to 1938, the deposited sediments would have averaged 6,331 acre-feet annually (Colorado Exhibit 218, Tr. Vol. XXXVIII, p. 6688), and the water holding capacity of the conservation pool would have declined from 382,600 acre-feet, as of January 1, 1908, to 186,350 acre-feet, as of December 31, 1938. Under such climatic and stream flow conditions, the useful effective life of the conservation pool will approximate 60 years. Major floods, as in 1921, cause excessive erosion upstream and will deposit large quantities of sediment in the reservoir. In the absence of such a major flood, useful life may approximate 80 years. Conversely, if several such floods should occur, useful life may be decreased to 40 years or less. Construction of the project was justified on the belief or assumption that major

and damaging floods will occur in the future, and hence their siltation effects must be anticipated.

Extension of the effective life of the conservation pool in Caddoa Reservoir, beyond the periods above mentioned, can be accomplished only by the construction of flood control reservoirs on each of the upstream tributaries where such major and damaging floods originate. The preservation of such tributary reservoir capacities, in turn, will require flood control, soil erosion prevention, and runoff retardation works upstream therefrom.

Evaporation losses from water surfaces at Caddoa Reservoir will average about 56 inches in depth annually (Colorado Exhibit 219, Tr. Vol. XXXVIII, p. 6689). After allowances for the effects of precipitation on the water surfaces, evaporation will consume 3.62 acre-feet of water annually for each acre of exposed water surface area. Such areas will vary with the quantities of water impounded in the reservoir, and hence will vary somewhat with administration and operation plans and programs. Several different operations plans are possible, under the Stipulation of 1933, and have been studied by the Colorado Water Conservation Board, as testified to by its chief engineer. Each of said operations plans, however, showed evaporation losses approximating 15,000 acre-feet annually. The Operations Plan described by the witness C. L. Patterson, involved evaporation losses varying by years from 5,000 to 27,200 and averaging 14,800 acre-feet annually during the 31-year study period (Colorado Exhibit 220, Tr. Vol. XXXVIII, p. 6694).

Under any plan of operation that might be devised or adopted, the conservation pool will vary from empty in some seasons to overflowing in others. The storage status at the close of each winter season, and at the end of each summer month, as it would have occurred, during the period 1908-1938, is shown in Colorado Exhibit 221, (Tr. Vol. XXXVIII, p. 6700). Of the 186 summer months in the 31-year study period, there were 27 months, or about one-seventh of the time, when no storage would have been on

hand, and no water available for release. At such times the ditches downstream in Colorado and Kansas, as in the past, would have been dependent on the stream flows passing through the reservoir and on the accretions entering below Caddoa. Including the said 27 months when available storage would have been zero, there were 36 others, or a total of 62 summer months in all, representing about one-third the time, when storage on hand would have been less than 40,000 acre-feet. At such times the supplies of water available to ditches downstream in Colorado and Kansas, in addition to the stream flows arriving at and entering below Caddoa, would be augmented by whatever releases would have been made from storage. Together, the stream flows arriving at the reservoir, the releases made therefrom if any, and the water supplies entering below Caddoa, constitute the resources which, under the 1933 Stipulation, are to be divided between the two states as therein specified.

The quantities of water released from the flood pool for flood control purposes, being waters in excess of the storage capacity of the conservation pool, under the Stipulation of 1933,

> "shall not be charged to either state, unless such releases are coincident with the request for water on behalf of said state or the use and diversion by the ditches in such state, and then only to the extent of the request or use so made" (Par. 6).

For convenience such flood pool releases are termed spills. Frequencies of such spills during 1908-1938 would have occurred in 9 of the 31-years. Total quantity of water spilled would have been 1,731,300 acre-feet,—equivalent to an average of 55,800 acre-feet per year. No spills would have occurred in the remaining 22 years of the study period, i. e. during the cycles 1908 to 1913; 1917 to 1920; 1925 to 1926; and 1929 to 1938. Had the study extended to date, no spills would have occurred in 1939 or 1940, but substantial spills would have resulted from the above-average precipitation over and runoff from plains areas in 1941 and 1942.

In the Stipulation of 1933 one of the recognized benefits to be derived from Caddoa Reservoir is the regulation of stream flows, to make the quantities of water previously diverted, defined therein as status quo allocations, available for use as nearly as may be in accordance with irrigation needs. To attain the objectives of maximum waste prevention, and greatest benefit from water utilization, it is necessary that stream flows in winter months be stored, so far as possible, and be used in summer months or crop growing seasons. Such winter storage quantities are indicated in Colorado Exhibit 221 (Tr. Vol. XXXVIII, p. 6700), by the gains from the end of September of one year to the end of March of the following year. After allowances for evaporation losses and reservoir spills, the net gain, due to winter storage, would have averaged 31,800 acre-feet per season. The storage of water in winter months would greatly reduce the winter diversions of Colorado ditches, but would not affect the quantities historically diverted in winter by ditches in Kansas, which have been and will continue to be supplied by return flows entering below Caddoa. However, under the plan, winter storage water would be released to meet both the summer diversion schedules of Colorado ditches and the summer delivery schedules to Kansas. These schedules were so devised that the Colorado ditches will receive in summer about two-thirds of the said winter storage, and Kansas will receive in summer the remaining one-third thereof. This contemplates a division, between the two states, of the regulation benefits of Caddoa Reservoir, in the same proportions, as specified in the 1933 Stipulation, for dividing the stream flows to protect existing rights and water supplies used in the two states. Winter storage accounts for approximately 20,000 acre-feet per year of the calculated surplus supplies and conservation benefits. Should the practice of winter storage be prohibited, by interpreting the provisions of the 1933 Stipulation, relative to the maintenance of status quo of diversions, to mean that winter diversions of Colorado ditches must continue in the future as in the past, then each state will lose about 10,000

acre-feet per year of surplus water that can be saved and will lose the conservation benefits that can be and should be created thereby.

Caddoa Reservoir operations will affect the character and the amount of the flows of the Arkansas River below the site, at the headgates of ditches downstream in Colorado, at the Stateline, and in Western Kansas, and, while the total flow will be diminished, the usable water supplies will be increased in amount. As indicated in Colorado Exhibit 223 (Tr. Vol. XXXVIII, p. 6628, App. "B," p. 68) total Stateline flows will be diminished 51,800 acre-feet in the average year. This diminution is attributable, to the extent of 15,900 acre-feet, to Caddoa Reservoir itself (14,800 acre-feet of evaporation loss, plus 1,100 acre-feet of carryover storage at the end of the study period), and, to the extent of 35,900 acre-feet, to the stream depletions in Colorado (Colorado Exhibit 225, Tr. Vol. XXXVIII, p. 6734, App. "B," p. 70), resulting from the additional diversions and increased uses in that state (Colorado Exhibit 227, Tr. Vol. XXXVIII, p. 6744), of its half of the surplus supplies to become available by reason of operations of the conservation pool. By reason of the said increased upstream depletions in Colorado and the said losses of water at Caddoa Reservoir, together withholding 51,600 acre-feet from the Stateline flows, the historically recorded average flow at the Stateline, of 260,700 acre-feet, will be diminished to an average during a similar climatic cycle in the future of 208,900 acre-feet annually.

The reduction in total Stateline flow, instead of adversely affecting or injuring Kansas, will in fact be beneficial to the irrigation interests of that state, not only because of savings in flood damages, but also because the usable Stateline flows will be increased in amount. The increase in usable Stateline flows, averaging 39,600 acre-feet, will increase the historically recorded average of 89,700 acre-feet to an after-Caddoa average of 129,300 acre-feet annually. All the said increase will become available for

additional diversions in summer thus increasing the usable summer supply from the historically recorded average of 63,500 acre-feet, to an after-Caddoa average of 103,100 acre-feet per season (Colorado Exhibit 224, Tr. Vol. XXXVIII, p. 6730, App. "B," p. 69). Had the analysis been based on a strict and technical interpretation of the Stipulation of 1933, the increase in usable water supplies to become available in Kansas would have amounted to 52,300 acre-feet per year and per summer season, that being the increase above the values of 77,000 acre-feet annually, and of 52,000 acre-feet per summer season, specified in said Stipulation.

Considered as ten-year averages, the surplus supplies to become available for additional diversion and increased use, or the conservation benefits of Caddoa Reservoir would have been divided equally between the two states under all the widely variable precipitation and stream flow conditions of the study period. During the first ten years (1908-1917), total benefits would have averaged 83,900 acre-feet per year, and would have been divided, 42,700 acre-feet per year, or 50.9% to Kansas, and 41,200 acre feet per year, or 49.1% to Colorado (Colorado Exhibit 226, Tr. Vol. XXXVIII, p. 6736, App. "B," p. 71). During the ten-year period of largest average surplus supplies, from 1916 to 1925, total benefits would have averaged 100,500 acre-feet per year, and would have been divided, 54,100 acre-feet per year, or 53.8% to Kansas, and 46,400 acre-feet per year, or 46.2% to Colorado. During the ten-year period of least surplus supplies, from 1929 to 1938, total benefits would have averaged 57,000 acre-feet per year, and would have been divided 28,700 acre-feet per year, or 50.4% to Kansas, and 28,300 acre-feet, or 49.6% to Colorado. Over the entire 31-year study period, total conservation benefits would have averaged 75,500 acre-feet per year, and would have been divided, 39,600 acre-feet per year, or 52.5%, to Kansas, and 35,900 acre-feet per year, or 47.5% to Colorado.

The above mentioned surplus supplies to become available for additional diversions and increased use, and the said conservation benefits to be created by operations of the conservation pool in the proposed Caddoa Reservoir, which, under the Stipulation of 1933, are to be divided equally between the two states, were calculated from the stream flow and diversions records of the 1908 to 1938 period, on the assumption that Caddoa Reservoir had been constructed to commence operations as of October 1, 1907. During the study period, more than half the initial capacity of the conservation pool would have been destroyed by siltation. Had the study been extended to cover a second similar climatic cycle, it would have been shown that reservoir spills would have been increased in frequency and average amount, due to the diminished and declining storage space, and that the surplus supplies captured, and the conservation benefits created, would have decreased in average amount, until, at the end of the second 34-year period, there being no remaining storage space, there would be no surplus capture and no conservation benefits available for allocation or diversion between the the states. Instead, both states would then be dependent on the unregulated stream flows, and their uses of water from the interstate stream would again revert to the conditions indicated by the recorded historical relations heretofore existing;

Under the variable conditions of rainfall and runoff, and of irrigation needs, imposed by nature on that part of the Arkansas Valley, in Eastern Colorado and Western Kansas, to be affected by the construction and operation of Caddoa Reservoir, it is necessary and desirable that, as indicated in the Stipulation of 1933, both the maintenance of status quo diversion relations and the division between the States of the surplus supplies and conservation benefits of Caddoa Reservoir, be carried out on the basis of long time averages. To that end, some method of accounting is essential, to permit of departures, within limitations, from the specified average relations, and to

include a system of monthly, seasonal, annual, and accumulative credits and debits (Tr. pp. 6708, Vol. XXXVIII).

Respectfully submitted,

GAIL L. IRELAND,
Attorney General
of the State of Colorado,
SAMUEL L. FAIRLAMB,
Assistant Attorney General,
ARTHUR C. GORDON,
Special Assistant Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,
Special Counsel for Complainant.

FILE COPY

Office - Supreme Court, U. S.
FILED.
SEP 15 1943
CHARLES ELMORE CROPLEY
CLERK

No. 5 Original

IN THE

Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, COMPLAINANT;

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

APPENDIX "B" TO BRIEF FOR COMPLAINANT. REPRODUCTION OF SELECTED EXHIBITS.

GAIL L. IRELAND,
Attorney General
of the State of Colorado,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant
Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,
Special Counsel for Complainant.

PEERLESS PRINTING COMPANY, DENVER

IN THE

Supreme Court of the United States

OCTOBER TERM, 1942

No. 5 Original

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

APPENDIX "B" TO BRIEF FOR COMPLAINANT.
REPRODUCTION OF SELECTED EXHIBITS.

PREFATORY STATEMENT

Appendix B is presented to make available for ready reference exact copies of those exhibits which the complainant deems particularly important and which can be readily reproduced in a volume of its size. Many of the maps and graphs which were introduced in evidence are so prepared and so large that it is impracticable to make copies. Much basic statistical information is contained in booklets which were received in evidence. Many of these booklets are of considerable length. Summaries

of the important matters contained therein appear either in the testimony or in the exhibits which are here reproduced.

In Appendix A is a list of all exhibits and all witnesses and a rather detailed statement of the evidence from the position of the complainant. It is thought that the use of these two appendices may facilitate the review of the lengthy record made before the Commissioner and the Special Master.

APPENDIX "B" TO BRIEF OF COMPLAINANT.

INDEX OF EXHIBITS.

COLORADO EXHIBITS

Colo. Ex.		Page
30	Data as to Areas of Counties in Colorado involved in Arkansas River Basin	1
31	Data as to Areas of Counties in Kansas involved in Arkansas River Basin	2
43	Areas of Counties of Kansas—Western, Central and Eastern Divisions	3
44	Population of State of Kansas, 1881-1930, by Divisions	4
46	Population of Central Kansas, 1881-1930	5
49	Population of Western Kansas, 1881-1930	6
52	Population of Finney County, Kansas and other Western Kansas Counties on Arkansas River, 1880-1930	7
53	Acres of Field Crops in Kansas, 1881-1930, by Divisions	8
55	Acres of Field Crops in Central Kansas, 1881-1930	9
57	Acres of Field Crops in Western Kansas, 1881-1930	10

Colo. Ex.		Page
64	Values of Agricultural Products of Kansas, 1881-1930	11
65	Values of Kansas Field Crops by State Divisions, 1881-1930	12
66	Values of Field Crops produced in Central Kansas, 1881-1930	13
67	Values of Field Crops produced in Western Kansas, 1881-1930	14
68	Summary by Decades of Values and Acres of Field Crops of Kansas	15
69	Total Assessed Valuations of All Property in Kansas by Decades	16
70	Assessed Valuations of Various Classes of Property in Kansas by Decades	17
71	Assessed Valuations of Lands in State of Kansas by Decades	18
73	Population Data of State of Colorado and Counties in Basin of Arkansas River, 1880-1930	19
74	Rates of Gain in Population—Comparison of gains 1890 to 1905 and 1905 to 1930 of United States, Kansas and Colorado	20
75	Acres of Field Crops Harvested in State of Colorado and Counties of Arkansas River Basin, 1924-1930	21
76	Acres of Field Crops Harvested, Average of Seven Year Period 1924-1930, for Kansas and Colorado	22
77	Values of Field Crops Harvested in State of Colorado and Counties of Arkansas River Basin, 1924-1930	23
78	Average Values of Field Crops Harvested, Seven Year Period 1924-1930, for Kansas and Colorado	24

Colo. Ex.		Page
79	Assessed Valuations of Counties of Southeastern Colorado, 1921-1930	25
80	Comparative Data as to Total Assessed Valuations in Kansas and Colorado, 1921-1930	26
135	Irrigation Requirements of Arid and Semi-Arid Lands	27
139	Map of Canals, Reservoirs and Reservoir Sites, Arkansas River in Western Kansas	28
158	Flow of Arkansas River at Pueblo and Holly and Natural Contributions of Tributaries and Quantities Consumed and Unconsumed, 1922-1925	29
179	Stipulation of December, 1933, as to Caddoa Reservoir	30-35
194	Diversions from Arkansas River in Colorado and Kansas, and Transmountain Diversions into Arkansas River Basin	36-41
195	Storage Data for 16 Principal Storage Reservoirs of Arkansas River Basin in Colorado	42-46
196	Irrigated Acreage Data by Water Districts, Division No. 2 for Colorado, and data as to Irrigated and Irrigable areas in Arkansas River Basin in Colorado and Kansas, also data as to Irrigated Areas in Scott County, Kansas	47-51
202	Map of Arkansas River Basin showing Irrigated Areas and Average Annual Precipitation, 1908-1938	52
203	Map of Arkansas River Basin showing Irrigated Areas and Average Annual Temperature, 1908-1938	53
204	Stream Flow Records for Principal Arkansas River Stations for Period 1908-1938	54-58
205	Map of Arkansas River Basin showing Drainage Areas by River Sections	59

Colo. Ex.		Page
208	Hydrographs of Arkansas River at Colorado-Kansas State Line, 1908-1938, showing daily mean values in second-feet	60
209	Arkansas River at Stateline and at Caddoa, 1908-1938—monthly, annual and seasonal values	61
210	Diversions and Accreations, Caddoa to Stateline, 1908-1938—monthly, annual and seasonal values	62
211	Divertible and Undivertible Water in Arkansas River at Stateline, 1908-1938—monthly, annual and seasonal values	63
212	Water Used by Kansas—Stateline to Garden City and Arkansas River at Garden City, 1908-1938—monthly, annual and seasonal values	64
213	Calculated Diversions by Kansas Ditches—Stateline to Garden City, 1908-1938—annual, summer and winter values	65
214	Hydrograph of Arkansas River at Stateline, 1908-1938—monthly values segregated to show total Stateline flow, divertible summer flow and usable summer flow	66
215	Hydrograph Showing Segregation of Summer Flows Crossing Stateline compared with Kansas Diversions, 1908-1938	67
223	Changes in Character and Amount of Stateline Flows—Operations Plan "F," averages for 1908-1938	68
224	Conservation Benefits to Kansas—Increased Usable Stateline Supplies of Summer Months, Operations Plan "F," 1908-1938	69
225	Stateline Flow Depletions—Operations Plan "F," 1908-1938	70
226	Comparative Conservation Benefits—Operations Plan "F," 1908-1938	71

KANSAS EXHIBITS

Kansas Ex.		Page
32	Return Flow, Arkansas River, Canon City to Holly, 1912-1930. By R. I. Meeker	72
134	Suggested Permanent Method of Division of Water of Arkansas River	73
135	Annual Flow of Arkansas River at Canon City, 1908-1938, corrected for diversions around gage and transmountain water	74

DATA AS TO AREAS OF COUNTIES IN COLORADO

Involved in Arkansas River Basin

and River Lengths in Each.

County Name	River Length (Miles)	Total Area (Sq. Mi.)	Area in Basin (Sq. Mi.)
Lake	22	371	371
Chaffee	52	1,083	1,083
Fremont	73	1,557	1,557
Pueblo	55	2,433	2,433
Crowley	18 (a)	808	808
Otero	20 (b)	1,259	1,259
Bent	35	1,524	1,524
Prowers	45	1,630	1,630
Sums	320	10,655	10,655
Park		2,242	330
Teller		547	315
El Paso		2,121	2,027
Elbert		1,857	595
Lincoln		2,570	1,932
Kiowa		1,798	1,798
Cheyenne		1,777	994
Custer		747	747
Huerfano		1,500	1,500
Las Animas		4,809	4,285
Baca		2,552	1,280
Sums	320	22,520	15,803
Area in New Mexico			100
Totals	320	33,175	26,558 (c)

(a) River is boundary line Crowley-Otero.
(b) Additional river length in Otero County.
(c) Includes 1,200 square miles drained into Kansas via tributaries. (Net area exclusive of the 1,200 square miles revised to 24,628 square miles on Colo. Ex. 205).

DATA AS TO AREAS OF COUNTIES IN KANSAS

Involved in Arkansas River Basin and River Lengths in Each

County Name	River Length (Miles)	Total Area (Sq. Mi.)	Area in Basin (Sq. Mi.)
Hamilton	32	972	972
Kearney	29	864	864
Finney	33	1,296	1,296
Gray	32	864	576
Ford	40	1,080	918
Edwards	23	612	612
Pawnee	30	756	756
Barton	26	900	740
Rice	21	720	693
Reno	31	1,260	1,260
Sedgwick	43	1,008	1,008
Sumner	20	1,188	684
Cowley	30	1,112	936
Sums	390	12,632	11,340
Greeley		780	598
Wichita		720	432
Scott		720	433
Lane		720	564
Ness		1,080	948
Hodgeman		864	864
Rush		720	480
Ellsworth		720	90
McPherson		900	510
Marion		954	152
Harvey		540	540
Butler		1,428	1,372
Stanton		672	364
Grant		576	74
Haskell		576	48
Kiowa		720	360
Pratt		720	580
Stafford		792	792
Kingman		864	504
Sums		15,066	9,655
Totals		27,698	20,995

Adding 1,200 sq. mi. from Colorado via tributaries makes 22,195 sq. mi.

PLATE 1

AREAS OF THE COUNTIES OF KANSAS

2TH BIENNIAL REPORT KANSAS STATE BOARD OF AGRICULTURE : PAGE 546

NOTES

ALL COUNTIES IN THESE THREE GROUPS ARE LOCATED ENTIRELY OUTSIDE THE ARKANSAS RIVER BASIN.

WESTERN DIVISION		CENTRAL DIVISION		EASTERN DIVISION	
COUNTY NAME	ACRES	COUNTY NAME	ACRES	COUNTY NAME	ACRES
CHEYENNE	654,766	BARBER	725,567	ALLEN	321,961
CLARK	617,889	CLAY	419,217	ANDERSON	371,200
DECATUR	573,683	CLOUD	456,692	ATCHISON	273,883
GOVE	688,779	COMANCHE	504,299	BOURBON	406,615
GRAHAM	574,445	ELLIS	575,653	BROWN	364,662
LOGAN	688,170	DICKINSON	840,426	CHASE	496,262
MEADE	622,709	HARPER	512,126	CHAUTAUQUA	412,886
MORTON	465,311	JEWELL	586,207	CHEROKEE	372,921
NORTON	565,257	LINCOLN	460,203	COFFEY	416,944
RAWLINS	688,989	MITCHELL	458,377	CRAWFORD	377,104
SEWARD	409,884	OSBORNE	573,144	DONIPHAN	248,870
SHERIDAN	574,538	OTTAWA	459,300	DOUGLAS	298,888
SHERMAN	675,931	PHILLIPS	574,785	ELK	415,238
STEVENS	464,754	REPUBLIC	460,074	FRANKLIN	365,945
THOMAS	687,145	ROOKS	573,972	GEARY	257,637
TREGO	575,003	RUSSELL	574,655	GREENWOOD	734,234
WALLACE	583,658	SALINE	460,494	JACKSON	420,191
		SMITH	575,160	JEFFERSON	359,154
		WASHINGTON	572,232	JOHNSON	305,794
				LABETTE	414,416
				LEAVENWORTH	291,492
				LINN	385,879
				LYON	546,066
				MARSHALL	573,200
				MIAMI	375,091
				MONTGOMERY	415,186
				MORRIS	449,510
				NEMAHA	469,707
				NEOSHO	366,193
				OSAGE	458,580
				POTTAWATOMIE	550,432
				RILEY	399,829
				SHAWNEE	354,433
				WABAUNSEE	507,880
				WILSON	366,716
				WOODSON	321,717
				WYANDOTTE	99,977
GROUP TOTAL	10,110,911	GROUP TOTAL	10,062,961	DIVISION TOTAL	14,544,032

COUNTIES WHOLLY OR IN PART INSIDE THE ARKANSAS RIVER BASIN.

OFF THE CHANNEL OF THE ARKANSAS RIVER

GRANT	367,763	BUTLER	921,494
GREELEY	496,993	ELLSWORTH	461,042
HASKELL	368,228	HARVEY	344,779
HODGEMAN	849,984	KINGMAN	551,952
LANE	489,359	KIOWA	459,612
NESS	486,372	MARION	609,149
SCOTT	499,030	McPHERSON	575,239
STANTON	434,520	PRATT	465,198
WICHITA	458,521	RUSH	458,074
		STAFFORD	505,899
GROUP TOTAL	4,280,775	GROUP TOTAL	5,352,488

ON THE CHANNEL ARKANSAS RIVER

FINNEY	832,196	BARTON	574,603
FORD	694,584	COWLEY	724,719
GRAY	555,335	EDWARDS	396,366
HAMILTON	637,932	PAWNEE	481,842
KEARNEY	555,463	RENO	808,651
		RICE	463,209
		SEDGWICK	644,869
		SUMNER	766,592
GROUP TOTAL	3,275,060	GROUP TOTAL	4,852,851
SUM INSIDE GROUPS	7,555,835	SUM INSIDE GROUPS	10,205,339
DIVISION TOTALS	17,666,746		20,268,300		14,564,032

PLATE 1

TOTAL AREA WHOLE STATE OF KANSAS 52,499,078 ACRES.

(ARRANGED AND SUMMARIZED BY C. L. PATTERSON, C.E.)

PLATE 2

POPULATION OF STATE OF KANSAS

1881-1930

ARRANGED IN DIVISIONS BY C.L. PATTERSON, C.E.

DATA FROM BIENNIAL REPORTS OF K.S.B.A.

YEAR	105 COUNTIES WHOLE STATE OF KANSAS POPULATION	31 COUNTIES WESTERN DIVISION POPULATION	37 COUNTIES CENTRAL DIVISION POPULATION	37 COUNTIES EASTERN DIVISION POPULATION
1880				
81	925075	25504	349366	549705
82	962949	28670	352600	581679
83	1028729	27786	380284	620659
84	1135614	28354	442019	663181
1885	1268530	41269	518400	708861
86	1406738	94190	575154	737394
87	1514578	127208	628454	758916
88	1518552	136725	621222	760605
89	1464914	118210	580008	766696
1890	1423485	101092	548009	774384
91				
92				
93	1366613	96210	550964	719439
94	1338331	90234	518344	729753
1895	1334734	76571	501124	757039
96	1336659	76655	486458	773546
97	1366789	73902	499398	793289
98	1390969	73489	509698	807782
99	1425119	77258	528956	818905
1900	1444708	80249	539321	825138
01	1467808	82729	543677	841402
02	1464628	84858	543246	836824
03	1487847	86428	551385	850034
04	1535160	91312	557287	886561
1905	1544968	94085	565498	885565
06	1611791	111850	583205	906736
07	1650160	130285	590858	929017
08	1656799	136263	596677	923859
09	1707491	134918	630291	942282
1910	1696361	135525	639357	921479
11	1686647	134338	643234	909075
12	1669296	124616	642126	902554
13	1685671	123810	646063	915798
14	1672106	119848	637154	915104
1915	1672545	125670	635046	911829
16	1715463	139919	652409	923135
17	1736900	150661	667587	918652
18	1734636	146862	672726	914998
19	1759793	146839	682164	930790
1920	1779936	150706	698323	930407
21	1792924	153791	698603	940530
22	1807022	157665	705060	944297
23	1824190	160081	709294	954815
24	1833882	160124	709462	964296
1925	1812986	163590	705268	944128
26	1822989	164045	700372	958572
27	1837514	161218	707704	968592
28	1838425	163188	710646	964591
29	1852114	163356	714056	969702
1930	1851024	177845	720225	962954

GAIN 67% — GAIN 269% — GAIN 62% — GAIN 61%

GAIN 20% — GAIN 89% — GAIN 27% — GAIN 9%

MEMO:- FROM U.S. FEDERAL CENSUS REPORTS
POPULATION OF CONTINENTAL UNITED STATES
1880 = 50,185,783
1905 = 83,983,420
1930 = 122,775,046

RATES OF GAIN 1880-1905 = 67%
1905-1930 = 46%

PLATE 5

POPULATION OF CENTRAL KANSAS
1881-1930
GROUPED WITH RESPECT TO BASIN OF ARKANSAS RIVER

Year	37 Counties Comprising Central Division: Population	% Gain	19 Counties Outside the Basin: Population	% Gain	18 Counties Within the Basin: Population	% Gain	10 Counties Within Basin but not on Channel: Population	% Gain	8 Counties Within Basin and on River Channel: Population	% Gain	Comparative Rates of Gain: Other Regions		
1880	349866		183713		166153		76579		89574		Eastern Division of Kansas Gain 61%	State of Kansas Gain 67%	United States Gain 39%
	352600		181524		171076		77873		93203				
	380284		192731		187553		82364		105189				
	442079		216101		225978		100054		125924				
1885	518400		248264		270136		120456		149670				
	575154		275326		299828		134251		165577				
	628454		292713		335741		148116		187625				
	621222		283574		337648		147288		190360				
	580008		268071		311937		126064		185873				
1890	549009	Gain 62%	253224	Gain 39%	294785	Gain 87%	126106	Gain 70%	168679	Gain 101%			
	550964		251071		299893		128332		171561				
	518344		237615		280729		122218		158511				
1895	501124		232720		268404		115732		152672				
	486458		223139		263319		117284		145935				
	499598		231169		268429		120279		148150				
	509698		237091		272607		120287		152320				
	528956		244768		284188		125117		159071				
1900	539321		250190		289131		126742		162389				
	543677		248960		294717		127809		166908				
	545246		244795		298451		127497		170954				
	551388		246218		305167		129668		175499				
	557287		248847		308440		129980		178460				
1905	565498		255222		310276		130481		179795				
	583205		262638		320567		132524		188043		Eastern Division of Kansas Gain 9%	State of Kansas Gain 20%	United States Gain 40%
	590858		265302		325556		133366		192190				
	596677		264898		331779		136104		195675				
	630291		272164		358127		142220		215907				
1910	639357		271783		367574		144419		223158				
	643234		274658		368581		143427		225154				
	642126		274670		367456		143381		224075				
	646073		275848		370115		143663		226452				
	637154		272224		364930		139627		225303				
1915	635046		272540		362506		142908		219598				
	652409	Gain 27%	279408	Gain 3%	373001	Gain 47%	148869	Gain 21%	224132	Gain 67%			
	667587		281798		385789		154999		230790				
	672776		271484		401292		167990		233302				
	682164		270233		411931		169418		242513				
1920	698823		270520		428303		169130		259173				
	698603		270132		428571		169877		258694				
	705060		274006		431054		167789		263265				
	709294		272802		436492		168828		270664				
	709462		269269		440193		164982		275211				
1925	708268		268719		436849		158243		277306				
	700372		263360		437012		157477		279535				
	707704		261381		446323		158180		288143				
	710646		260142		450504		158619		291885				
	714056		261125		452931		158049		294882				
1930	720225		262269		457956		157882		300104				

PLATE 5

POPULATION OF WESTERN KANSAS
1881-1930
GROUPED WITH RESPECT TO BASIN OF ARKANSAS RIVER

YEAR.	31 COUNTIES COMPRISING WESTERN DIVISION		17 COUNTIES OUTSIDE THE BASIN		14 COUNTIES WITHIN THE BASIN		9 COUNTIES WITHIN BASIN BUT NOT UPON RIVER CHANNEL		5 COUNTIES WITHIN BASIN AND ON RIVER CHANNEL		COMPARATIVE RATES OF GAIN OF OTHER REGIONS			
	POPULATION	% GAIN	POPULATION	% GAIN	POPULATION	% GAIN	POPULATION	% GAIN	POPULATION	% GAIN	CENTRAL KANSAS GAIN 62%	EASTERN DIVISION OF KANSAS GAIN 61%	STATE OF KANSAS GAIN 67%	UNITED STATES GAIN 59%
1880	25504		17804		7700		3432		3768					
	28670		19459		9211		4801		4410					
	27786		17698		10088		4780		5303					
	28354		17398		10956		4882		6074					
1885	41269		26040		15229		7864		7365					
	94190		56045		38145		26003		15142					
	127208		78159		49049		28625		20424					
	136725		84204		52521		29076		23445					
	118210		76686		41524		21878		19646					
1890	101092		69154		31938		16498		15444					
		GAIN 269%		GAIN 255%		GAIN 300%		GAIN 295%		GAIN 308%				
	96210		64849		31361		16582		14779					
	90234		62082		28152		15001		13101					
1895	76571		51908		24663		12368		12295					
	76655		51919		24736		12404		12332					
	73902		50096		23806		11616		12190					
	73489		50955		22534		11317		11217					
	77258		53927		23331		11720		11611					
1900	80249		58587		24662		11896		12766					
	82729		57789		24940		12529		12411					
	84858		58171		26687		13513		13174					
	86428		58595		27833		13811		14022					
	91312		62072		29240		14402		14838					
1905	94085		63207		30878		15514		15364					
	111850		75114		36736		17640		19096					
	130285		83816		46469		20305		26164					
	136263		87226		49037		21371		27666					
	134918		86443		48475		20321		28154					
1910	135525		87664		47861		19850		28011					
	134338		86723		47615		20612		27003					
	124616		79636		44980		18977		26003					
	123810		78772		45038		18805		26233					
	119848		76289		43559		18601		25498					
1915	125670		79988		45682		18271		27411					
	139919		89364		50855		21205		29650					
	150661		94163		56498		23563		32935					
	146862		92184		54678		23208		31470					
	146839		92787		54052		22791		31261					
1920	150706		95976		54730		23016		31714					
	153791		97421		56730		24100		32270					
	157665		99580		58085		25031		33054					
	160081		101023		59058		25978		33080					
	160124		101682		58442		25689		32753					
1925	163590		102760		60830		26822		34008					
	164045		102486		61559		26884		34675					
	161218		99340		61878		26124		35754					
	163188		100116		63072		26214		36858					
	168356		102499		65857		28058		37799					
1930	177845		105943		71902		28863		43039					

POPULATION OF FINNEY COUNTY, KANSAS
AND OTHER WESTERN KANSAS COUNTIES ON THE ARKANSAS RIVER
1880-1930

YEAR	5 COUNTIES HAMILTON, KEARNEY, FINNEY, GRAY & FORD		4 COUNTIES HAMILTON, KEARNEY, GRAY & FORD		FINNEY COUNTY		COMPARITIVE RATES OF GAIN OTHER REGIONS						CITY OF GARDEN CITY	SHERLOCK & GARDEN CITY TOWNSHIPS	ALL OTHER PORTIONS PRESENT COUNTY
	POPULATION	% GAIN	POPULATION	% GAIN	POPULATION	% GAIN							POPULATION	POPULATION	POPULATION
1880	(a) 3127		2389		(b) 848										
	3768		3040		(c) 728										
	4410		3692		(c) 941										
	5305		4330		(c) 975										
	6014		4947		(d) 1127										
1885	7365		6128		(e) 1240								378	288	436
	13142		9181		(f) 3961								2442	486	3696
	20424		13751		(g) 6673								(a) 2640	(g) 1463	(g) 3570
	23445		15089		(g) 7356								2819	927	3640
	19644		14026		5620								2323	599	2393
1890	15646		11280		4064								1445	878	1717
		GAIN 309%		GAIN 279%		GAIN 302%									
	14779		10791		3953								1612	818	1497
	13101		9345		3553								1392	894	1267
1895	12283		8744		(j) 3525								(j) 1864	(j) 950	(j) 1073
	12332		8827		3505								1628	1007	873
	12190		8357		3383								1583	888	912
	11217		8057		3160								1421	998	834
	11611		8411		3200								1580	936	844
1900	12766		9352		3214								1844	801	869
	12411		9123		3288								1478	932	977
	13174		10003		3171								1435	728	1008
	14032		10144		3273								1507	751	1018
	14333		11433		3405								1550	743	1112
1905	15364		12160		3204								1267	757	1180
	19036		14453		4613								2252	777	1584
	26164		19110		7054								3493	1369	1992
	27644		20208		7488								3453	1430	2175
	28184		20843		7609								3597	1399	2113
1910	28011		20810		7701								3718	1937	2080
	27003		20247		6756								3265	1635	1806
	26003		19373		6130								3087	1554	1519
	26253		19440		6293								3067	1711	1515
	25495		19383		6015								2803	1437	1575
1915	27411		21398		6016								3016	1462	1638
	29480	GAIN 186%	22934	GAIN 165%	6716	GAIN 223%							3197	1734	1780
	32938		25618		7317								3352	1983	2050
	31470		24034		7434								3504	1894	2036
	31241		23844		8197								3912	1909	2385
1920	31714		23573		7736								3387	1737	2162
	32270		24917		7453								3697	1761	1997
	33084		25845		7803								3729	1653	2127
	33050		25612		7468								3431	1736	2101
1925	32783		25240		7513								3394	1665	2054
	34008		25715		8293								4098	2091	2103
	34675		26477		8195								4132	1984	2052
	35784		27661		8093								3950	1975	2168
	36385		28175		8453								4440	2122	2121
	37799		29033		8766								4461	2137	2161
1930	43039		33048		10974								5143	2309	2817

WESTERN KANSAS GAIN 269%
CENTRAL KANSAS GAIN 82%
EASTERN KANSAS GAIN 41%
STATE OF KANSAS GAIN 87%
UNITED STATES GAIN 39%

WESTERN KANSAS GAIN 95%
CENTRAL KANSAS GAIN 21%
EASTERN KANSAS GAIN 9%
STATE OF KANSAS GAIN 20%
UNITED STATES GAIN 40%

(a) DATA FOR 1880 FROM FEDERAL CENSUS. FOR 1881-1930 KANSAS STATE BOARD OF AGRICULTURE.
(b) REPORTED AS SEQUOYAH COUNTY, AREA 864 SQ. MI.
(c) INTERPOLATED FOR 1881-1883.
(d) REPORTED AS 1149 FOR AREA 2880 SQ. MI.
(e) " " 1957 " " 2880 "
(f) " " 13442 " " 2808 "
(g) INTERPOLATED FOR 1887.
(h) REPORTED AS 2296 FOR AREA 864 SQ. MI.
(i) INTERPOLATED FOR 1895.
(j) INTERPOLATED FOR 1895.

PLATE II

ACRES OF FIELD CROPS IN KANSAS

DATA COMPILED AND REPORTED BY
KANSAS STATE BOARD OF AGRICULTURE AND
SUMMARIZED BY DIVISIONS BY
C. L. PATTERSON, CIVIL ENG.

YEAR		WHOLE STATE OF KANSAS	EASTERN DIVISION	CENTRAL DIVISION	WESTERN DIVISION	NOTES
		acres	acres	acres	acres	
1881	EARLY PERIOD	8,656,403	4,404,709	4,096,743	154,951	ALL ACREAGES ARE EXCLUSIVE OF PRAIRIE GRASS BUT INCLUDE ALL OTHER CROPS.
82		9,213,004	4,826,411	4,191,028	195,565	
83		8,282,821	4,011,688	4,109,824	161,309	
84		9,050,862	4,311,690	4,590,871	148,301	
1885		8,765,866	4,371,785	4,213,876	180,207	
86		9,857,616	4,662,288	4,790,921	404,407	
87		8,238,099	4,225,556	3,543,429	471,114	
88		10,083,083	4,831,581	4,356,209	906,293	
89		11,847,379	4,882,718	5,793,017	1,171,644	
1890		8,127,011	4,033,643	3,344,842	716,826	
91						
92						
93		18,198,154	8,613,320	7,581,584	2,033,243	
94		14,809,545	5,437,700	7,404,488	1,967,357	
1895		16,720,741	6,235,740	8,687,883	1,797,118	
96		15,336,029	5,832,695	7,888,940	1,614,406	
97		15,272,010	5,882,232	7,909,295	1,480,485	
98		15,858,882	6,059,421	8,126,413	1,643,048	
99		17,362,749	6,670,848	8,908,434	1,783,472	
1900		16,219,416	6,142,096	8,322,523	1,754,797	
01		16,843,313	6,317,678	8,598,731	1,926,604	
02		17,926,046	6,220,073	9,667,711	2,038,262	
03		17,263,816	6,134,515	9,032,663	2,096,838	
04		17,140,666	6,055,821	8,996,770	2,088,075	
1905		17,558,740	6,014,521	9,212,143	2,332,076	
06	RECENT PERIOD	17,689,189	5,887,428	9,195,490	2,605,271	GAIN 4,818,777 ACRES = 80% OF STATE GAIN
07		18,507,585	5,868,997	9,427,188	3,211,400	
08		18,472,022	5,662,189	9,292,661	3,517,173	
09		19,065,292	5,679,932	9,703,215	3,682,145	
1910		19,164,643	5,667,339	9,719,277	3,761,027	
11		18,978,685	5,880,166	9,832,834	3,265,685	
12		19,324,421	5,672,473	10,134,987	3,317,041	
13		19,000,748	5,880,419	10,009,729	3,110,600	
14		20,006,296	5,780,167	10,427,699	3,798,430	
1915		19,201,971	5,160,395	9,389,537	3,652,039	
16		20,704,293	5,987,899	10,530,905	4,175,489	
17		21,131,008	6,030,382	10,676,431	4,424,195	
18		21,234,548	6,240,757	10,710,611	4,283,180	
19		22,094,159	6,384,194	10,889,602	4,810,363	
1920		21,759,497	6,294,868	10,652,051	4,822,578	
21		21,191,583	6,046,762	10,430,829	4,713,992	
22		21,372,382	5,936,478	10,335,190	5,100,714	
23		21,371,825	5,937,987	10,418,111	5,015,727	
24		21,766,180	5,741,641	10,651,945	5,472,594	
1925		21,342,760	5,485,971	10,228,529	5,628,260	
26		21,499,445	5,416,636	10,696,602	5,386,227	
27		21,909,979	5,416,671	10,742,531	5,730,777	
28		22,690,108	5,382,318	10,902,660	6,405,130	
29		22,845,971	5,344,160	10,766,371	6,755,440	
1930		23,547,668	5,416,559	11,000,246	7,130,883	
		GAIN 8,902,337 ACRES DURING EARLY PERIOD	GAIN 1,409,812 ACRES = 18% OF STATE GAIN	GAIN 3,115,400 ACRES = 38% OF STATE GAIN	GAIN 2,117,125 ACRES = 24% OF STATE GAIN	
		GAIN 6,008,918 ACRES DURING RECENT PERIOD	LOSS 597,962 ACRES = 10% OF STATE GAIN	GAIN 1,788,103 ACRES = 30% OF STATE GAIN		

PLATE III

ACRES OF FIELD CROPS IN CENTRAL KANSAS

REPORTED BY
KANSAS STATE BOARD AGRICULTURE

SUMMARIZED BY
C. L. PATTERSON, CIVIL ENG.

YEAR		LOCATION OF COUNTIES WITH RESPECT TO ARKANSAS RIVER BASIN		LOCATION OF COUNTIES WHOLLY OR IN PART INSIDE OF BASIN RELATIVE TO CHANNEL OF ARKANSAS RIVER		NOTES
		ENTIRELY OUTSIDE "A"	WHOLLY OR PARTLY INSIDE "B"	OFF CHANNEL "D"	ON CHANNEL "C"	
1881	EARLY PERIOD	2,029,596	2,067,147	934,938	1,132,209	ALL ACREAGES ARE EXCLUSIVE OF PRAIRIE GRASS GROUP A PLUS GROUP B = TOTAL FOR DIVISION GROUP C PLUS GROUP D = GROUP B.
82		2,036,837	2,154,189	1,028,935	1,125,253	
83		2,085,101	2,054,723	928,980	1,125,743	
84		2,251,983	2,331,388	1,083,748	1,255,140	
1885		2,001,520	2,212,356	1,001,632	1,210,724	
86		2,376,087	2,414,834	1,147,306	1,267,528	
87		1,627,178	1,916,251	948,170	968,081	
88		2,116,195	2,234,014	1,032,979	1,201,035	
89		2,362,282	2,930,735	1,418,299	1,512,446	
1890		1,392,527	1,972,018	975,297	996,719	
91						
92						
93		3,684,272	3,867,814	1,849,616	2,017,698	DIVISION GAIN 5,115,400 ACRES EARLY PERIOD
94		3,542,053	3,762,435	1,845,922	2,016,813	
1895		4,219,176	4,468,767	2,065,756	2,402,951	
96		3,765,434	4,123,306	1,941,589	2,181,717	
97		3,823,763	4,085,530	1,900,298	2,185,232	
98		3,871,426	4,254,987	2,006,320	2,248,667	
99		4,271,604	4,634,830	2,183,449	2,453,381	
1900		3,958,947	4,363,576	2,069,959	2,293,617	
01		4,110,532	4,488,199	2,158,069	2,330,130	
02		4,302,340	4,730,123	2,287,025	2,448,098	
03		4,684,526	4,988,185	2,324,445	2,653,740	
04		4,269,791	4,724,791	2,272,494	2,454,435	
1905		4,364,584	4,847,559	2,346,343	2,501,216	
06	RECENT PERIOD	4,343,000	4,852,490	2,355,104	2,497,386	DIVISION GAIN 1,788,103 ACRES RECENT PERIOD
07		4,408,916	5,018,272	2,425,313	2,592,959	
08		4,348,281	4,944,350	2,407,309	2,537,071	
09		4,558,786	5,144,429	2,539,740	2,604,689	
1910		4,572,765	5,146,512	2,543,606	2,602,906	
11		4,607,820	5,225,014	2,584,132	2,640,882	
12		4,739,183	5,385,724	2,671,866	2,723,323	
13		4,909,454	5,200,278	2,630,629	2,569,644	
14		4,927,934	5,499,365	2,718,731	2,781,134	
1915		4,583,310	4,836,227	2,453,410	2,382,817	
16		4,963,172	5,567,733	2,781,390	2,786,343	
17		5,119,635	5,556,796	2,769,801	2,786,995	
18		5,082,425	5,658,186	2,763,888	2,894,298	
19		5,156,430	5,743,172	2,837,352	2,905,820	
1920		5,004,061	5,647,990	2,802,029	2,845,961	
21		4,923,375	5,507,454	2,746,522	2,760,932	
22		4,848,035	5,487,155	2,697,194	2,789,961	
23		4,922,257	5,495,854	2,758,236	2,737,598	
24		4,969,983	5,581,962	2,823,352	2,758,610	
1925		4,524,870	5,703,659	2,808,852	2,894,807	
26		4,958,657	5,737,945	2,835,315	2,902,630	
27		5,108,028	5,654,503	2,847,036	2,807,467	
28		5,177,048	5,725,612	2,875,409	2,850,203	
29		5,091,428	5,674,943	2,814,231	2,860,712	
1930		5,160,295	5,859,951	2,905,243	2,954,708	

GAIN 2,334,988 ACRES = 46% OF DIVISION GAIN

GAIN 2,780,412 ACRES, 54% OF DIVISION GAIN

GAIN 1,344,007 ACRES = 46% OF GROUP B GAIN

GAIN 1,411,405 ACRES = 51% OF GROUP B GAIN

GAIN 195,711 ACRES = 45% OF DIVISION GAIN

GAIN 992,392 ACRES = 55% OF DIVISION GAIN

GAIN 453,442 ACRES = 46% OF GROUP B GAIN

GAIN 538,950 ACRES = 54% OF GROUP B GAIN

PLATE 14

ACRES OF FIELD CROPS IN WESTERN KANSAS

REPORTED BY
KANSAS STATE BOARD AGRICULTURE

SUMMARIZED BY
C. L. PATTERSON, CIVIL ENG.

YEAR		LOCATION RELATIVE TO ARKANSAS RIVER BASIN: ENTIRELY OUTSIDE "A"		WHOLLY OR PARTLY INSIDE "B"		COUNTIES WHOLLY OR PARTLY INSIDE LOCATION RELATIVE TO CHANNEL OF ARKASAS RIVER: OFF CHANNEL "D"		ON CHANNEL "C"		
1881	EARLY PERIOD	118,706	GAIN 94 ACRES PER SQUARE MILE OF GROUP AREA	36,245	GAIN 59 ACRES PER SQUARE MILE OF GROUP AREA	32,405	GAIN 63 ACRES PER SQUARE MILE OF GROUP AREA	3,840	GAIN 53 ACRES PER SQUARE MILE OF GROUP AREA	ALL ACREAGES ARE EXCLUSIVE OF PRESIDIO GRASS. GROUP A PLUS GROUP B, TOTAL OF WESTERN DIVISION. GROUP C PLUS GROUP D, GROUP B. GAIN 79 ACRES PER SQUARE MILE OF DIVISION AREA
82		130,453		65,115		35,870		29,245		
83		122,793		38,516		29,543		8,973		
84		110,897		37,404		26,177		11,227		
1885		131,991		48,216		32,822		15,394		
86		319,899		84,508		53,444		31,064		
87		361,199		109,915		68,299		41,616		
88		625,658		280,635		193,420		87,215		
89		803,335		368,309		224,093		144,216		
1890		476,401		240,425		150,398		90,027		
91										
92										
93		1,399,124		634,124		416,695		217,429		
94		1,351,633		615,724		399,444		216,280		
1895		1,272,282		524,836		335,487		189,349		
96		1,089,332		525,074		363,364		161,710		
97		1,029,654		450,831		308,344		141,487		
98		1,166,022		477,026		328,837		148,189		
99		1,317,921		465,551		310,741		154,810		
1900		1,305,698		449,099		290,063		159,036		
01		1,408,557		518,347		343,083		175,264		
02		1,471,869		566,393		370,018		196,375		
03		1,510,180		586,658		369,203		217,455		
04		1,468,909		619,166		378,228		240,938		
1905		1,601,237		730,839		456,716		274,123		
06	RECENT PERIOD	1,762,869	GAIN 171%	842,402	GAIN 176 ACRES PER SQUARE MILE OF GROUP AREA	530,178	GAIN 175 ACRES PER SQUARE MILE OF GROUP AREA	312,224	GAIN 178 ACRES PER SQUARE MILE OF GROUP AREA	DIVISION GAIN 204% RECENT PERIOD. GAIN 174 ACRES PER SQUARE MILE OF DIVISION AREA
07		2,136,291		1,075,109		657,723		417,386		
08		2,299,752		1,217,421		728,451		488,970		
09		2,487,405		1,194,740		660,259		534,481		
1910		2,588,281		1,179,746		600,734		579,012		
11		2,231,453		1,034,232		524,105		510,127		
12		2,299,540		1,017,501		482,128		535,373		
13		2,224,824		883,776		397,494		488,282		
14		2,573,733		1,224,697		656,590		568,107		
1915		2,539,320		1,112,719		542,547		570,172		
16		2,862,474		1,313,015		659,011		654,004		
17		2,962,577		1,461,618		730,027		731,531		
18		2,910,453		1,372,727		710,387		662,340		
19		3,232,281		1,578,082		796,280		781,802		
1920		3,209,122		1,613,456		815,461		797,995		
21		3,099,272		1,614,720		869,426		745,294		
22		3,388,736		1,711,978		814,100		797,879		
23		3,342,037		1,673,690		909,620		764,070		
24		3,606,601		1,865,993		1,050,561		815,432		
1925		3,642,228		1,986,032		1,099,984		886,048		
26		3,296,158		2,090,069		1,191,688		898,381		
27		3,695,395		2,035,382		1,133,736		901,646		
28		4,091,289		2,313,841		1,303,215		1,010,626		
29		4,149,740		2,608,700		1,508,228		1,097,472		
1930		4,335,617		2,815,236		1,628,655		1,186,581		

GAIN 171% GAIN 176 ACRES PER SQUARE MILE OF GROUP AREA GAIN 285% GAIN 257% GAIN 175 ACRES PER SQUARE MILE OF GROUP AREA GAIN 332% GAIN 178 ACRES PER SQUARE MILE OF GROUP AREA

PLATE [illegible]

VALUES OF AGRICULTURAL PRODUCTS OF KANSAS

DATA REPORTED BY KANSAS STATE BOARD AGRICULTURE.

ARRANGED AND AVERAGED BY
C. L. PATTERSON, CIVIL ENGINEER

YEAR	TOTAL VALUE OF ALL AGRICULTURAL PRODUCTS (a)		TOTAL VALUE OF THE FIELD CROPS (b)		TOTAL VALUE OF ALL OTHER PRODUCTS (c)		NOTES.
1881	$ 115,943,985		$ 88,692,222		$ 30,301,763		(a) ALL FIGURES ARE ABSTRACTED FROM SUMMARIES BY KANSAS STATE BOARD OF AGRICULTURE.
82	138,065,465	$ 131,725,300	100,676,978	$ 84,439,400	37,388,487	$ 47,316,900	(b) FIELD CROPS ARE WHEAT, CORN, OATS, RYE, BARLEY, POTATOES, COWPEAS, SORGHUMS, FLAX, COTTON, BROOM CORN, MILLET, SUGAR BEETS, PINTO BEANS, SORGHUMS, MILO, KAFIR, PETERITA, SUDAN GRASS, ALFALFA, TIMOTHY, CLOVER, ETC., BUT NOT PRAIRIE GRASS.
83	142,210,318		93,533,984		48,676,324		
84	147,374,613		84,498,598		62,885,019		
1885	122,814,994		74,581,262		48,233,732		
86	124,742,763		76,672,629		48,070,134		
87	114,923,782		65,301,742		49,622,040		
88	143,257,768		96,112,571		47,145,197		
89	147,081,496		96,762,997		50,288,499		
1890	121,127,645		70,568,646		50,557,989		
91	169,810,850		117,633,119		52,177,731		
92	164,648,947	$ 144,108,400	111,355,850	$ 87,328,000	53,293,097	$ 58,780,400	
93	122,570,537		63,676,908		58,899,629		
94	113,335,891		55,418,159		57,957,702		
1895	128,563,784		74,202,387		54,361,387		
96	116,290,011		65,422,844		50,867,145		
97	136,335,263		83,407,394		52,927,874		
98	151,973,828		86,888,108		65,068,720		
99	169,845,257		102,029,996		67,815,291		
1900	187,784,406		113,285,386		74,511,019		
01	195,284,683		108,995,568		86,289,085		
02	216,002,055	$ 248,597,200	144,781,843	$ 153,784,500	71,220,212	$ 94,842,700	
03	223,984,499		144,515,585		79,468,914		
04	208,406,366		134,631,896		73,774,470		
1905	238,334,425		158,589,054		80,247,371		
06	246,905,081		156,305,858		90,599,193		
07	266,387,750		157,236,771		109,160,979		
08	277,733,953		183,564,573		94,169,380		
09	307,538,165		207,600,245		99,937,920		
1910	304,914,342		191,323,126		113,591,216		
11	282,927,188		162,982,644		119,944,542		
12	324,988,943	$ 448,500,500	221,251,144	$ 316,925,700	103,737,799	$ 131,574,800	
13	241,470,426		123,060,417		118,410,009		
14	376,297,713		275,892,860		100,705,153		
1915	342,843,467		243,449,493		99,393,974		
16	371,188,476		265,559,220		105,629,256		
17	507,493,787		378,039,967		129,443,320		
18	592,017,249		430,021,143		161,996,106		
19	746,619,135		548,603,969		198,015,166		
1920	699,170,341		520,696,841		178,473,500		
21	351,121,242		215,995,639		135,125,603		
22	357,286,774	$ 451,435,000	240,467,933	$ 291,282,500	116,788,841	$ 160,152,500	
23	384,727,510		252,936,996		131,990,514		
24	501,629,564		371,780,794		129,869,772		
1925	418,748,849		274,781,645		143,967,224		
26	469,488,853		310,524,593		158,964,265		
27	504,004,586		341,120,948		162,883,621		
28	537,429,753		377,356,694		160,073,059		
29	548,421,056		305,048,647		243,352,409		
1930	441,322,240		222,811,300		218,710,940		(c) LIVESTOCK, POULTRY, DAIRY, HORTICULTURAL AND OTHER PRODUCTS.

PLATE 23

VALUES OF THE KANSAS FIELD CROPS BY STATE DIVISIONS

REPORTED BY COUNTIES
BY KANSAS STATE BOARD OF AGRICULTURE
SUMMARIES BY C. L. PATTERSON, CIVIL ENG.

YEAR	WHOLE STATE OF KANSAS		EASTERN DIVISION		CENTRAL DIVISION		WESTERN DIVISION	
	dollars		dollars		dollars		dollars	
1881	$ 91,928,376		$ 47,304,270		$ 43,478,240		$ 1,145,866	
82	108,177,818		58,092,940		48,354,460		1,730,118	
83	93,465,151	$ 85,576,000	48,030,050	$ 42,582,000	44,482,050	$ 36,587,000	953,021	$ 3,437,000
84	83,840,923		42,607,600		40,073,116		1,160,213	
1885	73,877,167		36,717,180		35,387,150		1,772,837	
86	76,689,238		37,170,230		35,468,650		4,050,358	
87	65,282,262		33,218,890		27,591,090		4,473,282	
88	96,113,900		49,889,490		38,512,300		7,712,110	
89	96,234,930		36,837,320		52,438,960		6,958,650	
1890	70,148,683		38,953,000		29,785,730		4,409,953	
91	117,600,000		63,560,000		47,000,000		7,100,000	
92	111,400,000		60,200,000		44,500,000		6,700,000	
93	63,529,000	$ 37,406,000	36,261,220	$ 41,445,000	23,579,120	$ 39,945,000	3,688,670	$ 5,976,000
94	56,635,663		33,732,960		18,978,840		2,923,863	
1895	74,109,796		39,420,980		29,080,750		5,608,066	
96	68,307,183		28,431,760		33,394,890		3,480,535	
97	83,407,394		29,080,174		47,089,160		7,238,060	
98	86,885,109		35,504,121		45,398,850		7,952,138	
99	102,030,095		42,246,380		52,799,960		6,983,755	
1900	113,285,386		48,274,909		57,826,850		8,150,627	
01	108,995,563		37,346,474		62,212,000		9,437,094	
02	144,781,843	$ 158,764,000	69,653,432	$ 54,828,000	65,417,530	$ 85,384,000	9,710,881	$ 18,042,000
03	144,515,585		46,824,336		79,082,359		18,608,890	
04	134,631,896		36,457,214		86,113,282		12,061,400	
1905	158,589,064		56,748,777		81,880,702		19,959,575	
06	156,305,858		55,695,944		82,828,937		17,780,955	
07	157,236,771		59,844,312		79,059,550		18,332,909	
08	183,564,873		57,196,790		107,363,620		19,004,163	
09	207,600,245		66,814,425		112,361,140		28,424,680	
1910	191,323,126		61,695,926		102,524,540		27,102,660	
11	162,982,644		61,621,242		86,490,400		14,811,004	
12	221,251,144	$ 316,926,000	78,513,209	$ 106,724,000	121,497,440	$ 155,682,000	21,178,495	$ 51,520,000
13	123,060,417		44,256,766		66,985,130		11,818,521	
14	275,502,560		80,131,362		148,919,000		46,541,198	
1915	243,449,493		69,747,598		127,270,810		46,431,085	
16	265,559,220		71,233,331		136,309,950		58,015,939	
17	378,039,967		164,292,531		176,691,520		37,055,916	
18	430,021,143		156,453,537		221,303,750		52,263,806	
19	548,603,969		182,551,159		254,392,080		111,660,730	
1920	520,696,841		158,318,571		247,960,620		114,417,650	
21	215,995,659	$ 291,253,000	61,136,329	$ 86,219,000	114,448,780	$ 141,382,000	40,390,030	$ 63,652,000
22	240,447,933		73,515,713		118,943,920		48,008,300	
23	282,936,996		80,013,316		115,212,110		57,711,570	
24	371,759,794		112,620,174		179,091,730		80,047,390	
1925	274,781,645		101,040,235		118,533,010		55,208,400	
26	310,524,593		87,790,573		163,235,120		59,498,900	
27	341,120,965		105,743,215		183,024,680		49,355,070	
28	377,356,694		101,965,774		183,013,190		92,377,730	
29	385,068,647		77,164,397		135,291,810		92,612,440	
1930	222,311,300		58,196,150		103,001,030		61,614,120	

PLATE 25

VALUES OF FIELD CROPS PRODUCED IN CENTRAL KANSAS

DATA REPORTED BY COUNTIES
BY KANSAS STATE BOARD OF AGRICULTURE

ARRANGED AND SUMMARIZED BY
C. L. PATTERSON, CIVIL ENG.

YEAR	LOCATION OF COUNTIES RELATIVE TO ARKANSAS RIVER BASIN				LOCATION OF COUNTIES RELATIVE TO CHANNEL OF ARKANSAS RIVER				NOTES
	19 COUNTIES ENTIRELY OUTSIDE		15 COUNTIES WHOLLY OR PARTLY INSIDE		10 COUNTIES NOT ON CHANNEL		8 COUNTIES CROSSED BY CHANNEL		
	dollars		dollars		dollars		dollars		
1881	18,543,060		24,935,180		10,705,750		14,231,430		
82	22,124,070		26,230,390		12,342,880		13,537,510		
83	19,912,060	$ 18,449,700	24,570,020	$ 21,107,400	11,129,470	$ 9,737,200	13,440,550	$ 11,370,200	
84	19,441,700		20,131,410		9,215,220		10,913,190		
1885	17,152,170		18,234,930		8,023,930		10,211,050		
86	17,690,060		17,778,590		8,571,150		9,297,410		
87	12,043,370		15,847,720		7,270,380		8,277,420		
88	19,347,990		19,164,310		8,690,940		10,473,370		
89	25,525,780		26,913,180		12,672,210		14,240,970		
1890	12,216,860		17,866,170		8,698,520		8,869,480		
91									
92									
93	11,008,060	$ 17,342,400	12,571,060	$ 20,676,200	5,892,880	$ 9,904,600	6,768,180	$ 10,771,400	
94	9,093,020		10,885,820		5,147,740		5,738,080		
1895	12,647,280		16,413,460		8,120,038		8,293,421		
96	16,536,490		16,840,400		8,423,219		8,417,581		
97	21,926,380		25,162,770		11,332,680		13,830,090		
98	20,229,230		25,169,620		12,175,300		12,944,320		
99	27,093,340		25,706,620		12,432,110		13,274,510		
1900	25,169,420		32,660,430		15,803,630		16,850,680		
01	26,868,800		33,343,200		15,824,340		19,318,860		
02	30,304,230		34,913,300		16,477,370		18,435,730		
03	40,210,864	$ 40,271,000	38,871,795	$ 45,613,000	18,748,206	$ 22,139,700	20,123,889	$ 23,473,300	
04	40,635,860		45,477,472		20,420,047		25,057,375		
1905	38,745,608		42,135,094		19,566,217		22,568,577		
06	37,311,281		43,517,656		21,377,949		24,139,707		
07	36,115,090		42,941,460		22,100,190		20,841,270		
08	50,457,340		56,576,230		28,317,890		29,558,640		
09	49,701,580		63,659,560		29,592,900		33,066,660		
1910	31,129,810		51,306,730		25,931,380		25,463,350		
11	26,036,960		50,455,440		25,588,160		24,867,280		
12	57,647,950	$ 72,953,000	63,849,490	$ 85,719,000	31,760,100	$ 42,105,000.	32,089,390	$ 43,614,000	
13	32,722,400		34,262,730		17,936,260		16,326,470		
14	66,668,570		82,250,430		40,690,360		41,560,070		
1915	66,336,960		60,933,550		31,186,080		29,747,770		
16	67,586,630		67,782,270		34,362,570		33,380,700		
17	68,071,070		108,620,450		53,517,400		55,103,050		
18	84,008,290		137,295,460		65,646,300		71,648,460		
19	120,860,950		133,331,130		64,375,536		69,155,600		
1920	129,620,640		113,238,380		53,982,330		62,267,650		
21	31,308,920		63,159,860		31,649,470		31,510,390		
22	50,916,090	$ 63,743,000	68,027,830	$ 77,639,000	34,052,320	$ 38,506,000	33,975,510	$ 39,133,000	
23	59,186,650		56,025,460		29,750,340		26,275,120		
24	80,303,090		98,788,640		49,838,520		49,950,120		
1925	44,804,530		73,728,490		35,124,530		38,603,900		
26	55,207,620		108,027,620		51,963,430		56,064,190		
27	87,969,450		95,083,230		48,188,410		46,864,820		
28	90,413,360		92,599,830		45,677,510		46,922,320		
29	66,302,090		68,989,730		34,374,960		34,614,770		
1930	51,014,760		51,936,270		28,443,280		26,542,890		

PLATE 25

VALUES OF FIELD CROPS PRODUCED IN WESTERN KANSAS

DATA REPORTED BY COUNTIES BY
KANSAS STATE BOARD OF AGRICULTURE

ARRANGED AND SUMMARIZED BY
C.L. PATTERSON, CIVIL ENGINEER

YEAR	LOCATION OF COUNTIES RELATIVE TO ARKANSAS RIVER BASIN				LOCATION OF COUNTIES RELATIVE TO CHANNEL OF ARKANSAS RIVER				NOTES
	17 COUNTIES ENTIRELY OUTSIDE		14 COUNTIES WHOLLY OR PART INSIDE		9 COUNTIES NOT ON CHANNEL		5 COUNTIES CROSSED BY CHANNEL		
	dollars		dollars		dollars		dollars		
1881	$ 661,155		$ 484,731		$ 440,217		$ 44,514		
82	799,852		930,266		727,447		202,819		
83	669,226	$ 2,274,000	283,795	$ 1,165,000	214,605	$ 736,000	69,190	$ 429,000	
84	813,885		286,328		171,944		114,384		
1885	1,181,037		591,300		386,737		205,043		
86	3,110,630		939,728		574,197		365,531		
87	3,258,921		1,214,361		760,511		453,850		
88	5,467,330		2,244,736		1,466,600		778,136		
89	4,500,281		2,455,349		1,405,246		053,103		
1890	2,209,030	—	2,200,923	—	1,203,448	—	997,475	—	
91									
92									
93	2,599,153	$ 3,937,600	1,089,517	$ 1,804,900	531,643	$ 1,028,000	557,849	$ 778,900	
94	1,603,971		1,219,892		492,343		527,549		
1895	3,322,672		1,785,394		1,064,818		720,576		
96	2,427,964		1,052,571		544,520		486,051		
97	4,999,220		2,238,840		1,406,250		832,590		
98	5,753,490		2,198,448		1,290,500		907,948		
99	5,031,175		1,952,550		1,011,748		940,832		
1900	5,263,004	—	2,917,623	—	1,659,746	—	1,257,877	—	
01	6,003,381		3,433,206		1,706,791		1,726,415		
02	7,062,092		2,648,789		1,313,643		1,335,146		
03	13,402,916	$ 12,404,900	5,205,974	$ 5,637,500	3,406,266	$ 2,780,600	1,799,709	$ 2,856,900	
04	8,979,976		3,081,424		1,783,419		1,328,005		
1905	14,453,535		5,506,040		3,186,113		2,319,927		
06	12,606,610		5,174,348		2,894,421		2,279,924		
07	11,345,600		6,437,309		3,034,965		3,402,344		
08	12,748,130		6,256,033		2,366,612		3,879,421		
09	16,809,920		8,614,760		3,879,117		4,735,643		
1910	17,086,210	—	10,016,450	—	4,264,221	—	5,752,228	—	
11	8,677,429		6,133,575		2,275,838		3,857,737		
12	10,833,097		10,295,393		4,192,166		6,103,232		
13	8,341,444	$ 35,021,100	3,277,077	$ 16,498,400	589,996	$ 7,535,100	2,717,081	$ 8,963,300	
14	29,978,330		16,843,818		8,495,892		8,667,926		
1915	31,805,450		14,625,635		6,971,434		7,654,201		
16	41,468,470		17,547,464		7,356,137		10,191,332		
17	23,571,130		13,494,796		8,208,689		5,276,127		
18	35,405,190		16,888,616		8,279,939		8,578,677		
19	79,073,140		32,587,890		14,384,050		18,203,840		
1920	80,804,320	—	33,612,530	—	17,627,000	—	15,985,530	—	
21	25,784,130		14,605,900		7,259,610		7,346,290		
22	32,770,320	$ 38,332,900	15,237,780	$ 24,329,400	7,085,370	$ 12,545,000	8,152,410	$ 12,215,480	
23	38,212,350		19,498,720		11,094,400		8,444,320		
24	49,934,780		30,093,110		15,250,100		14,843,010		
1925	36,149,900		19,088,500		8,720,250		10,338,250		
26	23,439,630		31,089,270		13,135,020		17,324,250		
27	32,214,350		17,138,720		8,344,920		8,793,800		
28	53,276,710		29,101,020		20,500,740		15,600,280		
29	52,207,480		40,404,960		21,373,670		19,031,290		
1930	39,517,860	—	22,094,260	—	12,046,060	—	10,050,200	—	

PLATE 27

SUMMARY BY DECADES OF THE VALUES AND ACRES OF THE FIELD CROPS OF KANSAS.

DATA REPORTED BY KANSAS STATE BOARD OF AGRICULTURE. SUMMARIES BY C. L. PATTERSON, CIVIL ENGINEER

PLATE 27

		DECADES →	1881-1890	1891-1900	1901-1910	1911-1920	1921-1930	50 YR AVG.
STATE OF KANSAS 105 COUNTY TOTALS		VALUES	$ 85,760,080	$ 80,556,480	$ 158,754,000	$ 316,926,000	$ 291,283,000	
		ACRES	9,212,714	15,847,191	17,963,132	20,223,543	21,957,791	
		PER ACRE	$ 9.32	$ 5.08	$ 8.84	$ 15.70	$ 13.26	$ 10.44
EASTERN DIVISION 37 COUNTY TOTALS		VALUES	$ 42,582,808	$ 36,273,300	$ 54,828,000	$ 106,724,000	$ 86,219,000	
		ACRES	4,484,207	5,988,004	5,951,950	5,931,173	5,612,519	
		PER ACRE	$ 9.33	$ 6.05	$ 9.20	$ 17.98	$ 15.36	$ 11.62
CENTRAL DIVISION	CENTRAL DIVISION 37 COUNTY TOTALS	VALUES	$ 39,557,000	$ 38,515,600	$ 85,884,000	$ 158,682,000	$ 141,382,000	
		ACRES	4,306,445	8,060,944	9,284,545	10,325,430	10,669,301	
		PER ACRE	$ 9.19	$ 4.78	$ 9.25	$ 15.37	$ 13.33	$ 10.38
	19 COUNTY TOTALS OUTSIDE OF BASIN	VALUES	$ 18,449,708	$ 17,542,400	$ 40,271,000	$ 72,853,000	$ 63,743,000	
		ACRES	2,074,930	3,592,110	4,396,360	4,892,330	4,968,400	
		PER ACRE	$ 8.89	$ 4.88	$ 9.16	$ 14.90	$ 12.83	$ 10.07
	18 COUNTY TOTALS INSIDE OF BASIN	VALUES	$ 21,107,400	$ 20,676,200	$ 45,613,000	$ 85,719,000	$ 77,639,000	
		ACRES	2,229,500	4,207,840	4,888,200	5,433,100	5,640,900	
		PER ACRE	$ 9.45	$ 4.91	$ 9.34	$ 15.80	$ 13.77	$ 10.65
	10 COUNTY TOTALS NOT ON CHANNEL	VALUES	$ 9,737,200	$ 9,904,800	$ 22,134,700	$ 42,105,000	$ 38,306,000	
		ACRES	1,050,020	1,982,870	2,365,930	2,701,330	2,809,140	
		PER ACRE	$ 9.27	$ 5.00	$ 9.34	$ 15.60	$ 13.70	$ 10.58
	8 COUNTY TOTALS ON CHANNEL	VALUES	$ 11,370,200	$ 10,771,400	$ 23,473,300	$ 43,614,000	$ 36,133,000	
		ACRES	1,179,450	2,224,970	2,522,270	2,781,770	2,831,760	
		PER ACRE	$ 9.63	$ 4.84	$ 9.34	$ 15.90	$ 13.83	$ 10.71
WESTERN DIVISION	WESTERN DIVISION 31 COUNTY TOTALS	VALUES	$ 3,437,080	$ 5,744,500	$ 18,042,000	$ 51,520,000	$ 63,682,000	
		ACRES	451,062	1,784,243	2,716,617	3,965,960	5,735,971	
		PER ACRE	$ 7.62	$ 3.26	$ 6.65	$ 13.00	$ 11.10	$ 8.32
	17 COUNTY TOTALS OUTSIDE OF BASIN	VALUES	$ 2,274,000	$ 3,937,600	$ 12,404,900	$ 35,021,100	$ 38,852,800	
		ACRES	320,132	1,241,461	1,863,534	2,704,576	3,664,707	
		PER ACRE	$ 7.10	$ 3.17	$ 6.66	$ 12.94	$ 10.60	$ 8.09
	14 COUNTY TOTALS INSIDE OF BASIN	VALUES	$ 1,163,000	$ 1,806,900	$ 5,637,500	$ 16,498,400	$ 24,829,200	
		ACRES	130,930	517,782	853,083	1,261,384	2,071,264	
		PER ACRE	$ 8.89	$ 3.48	$ 6.61	$ 13.10	$ 12.00	$ 8.82
	9 COUNTY TOTALS NOT ON CHANNEL	VALUES	$ 735,000	$ 1,028,000	$ 2,780,600	$ 7,535,100	$ 12,544,000	
		ACRES	84,647	344,246	509,459	631,610	1,160,922	
		PER ACRE	$ 8.69	$ 2.99	$ 5.46	$ 11.93	$ 10.80	$ 7.97
	5 COUNTY TOTALS ON CHANNEL	VALUES	$ 428,000	$ 778,900	$ 2,856,900	$ 8,963,300	$ 12,285,400	
		ACRES	46,283	173,536	343,622	629,974	910,342	
		PER ACRE	$ 9.25	$ 4.48	$ 8.31	$ 14.23	$ 13.50	$ 9.95

PLATE 28

TOTAL ASSESSED VALUATIONS OF ALL PROPERTY IN KANSAS

DATA REPORTED BIENNIALLY BY COUNTIES BY THE KANSAS-STATE BOARD AGRICULTURE
ARRANGED AND AVERAGED BY C. L. PATTERSON, CIVIL ENGINEER

VALUATIONS SHOWN ARE AVERAGED BY DECADES

	FIRST DECADE 1882-1890	SECOND DECADE 1894-1900	THIRD DECADE 1902-1910	FOURTH DECADE 1912-1920	FIFTH DECADE 1922-1930
TOTALS FOR 105 COUNTIES COMPRISING WHOLE STATE OF KANSAS dollars	$ 280,032,000	$ 330,188,000	$ 1,267,432,000	$ 3,164,179,000	$ 3,663,206,000
PERCENT OF FIRST DECADE	100%	122%	452%	250%	299%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 37 COUNTIES COMPRISING EASTERN DIVISION dollars	$ 151,876,000	$ 174,228,000	$ 607,603,000	$ 1,422,417,000	$ 1,639,678,000
PERCENT OF FIRST DECADE	100%	115%	400%	234%	270%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 37 COUNTIES COMPRISING CENTRAL DIVISION dollars	$ 107,919,000	$ 122,600,000	$ 543,017,000	$ 1,445,582,000	$ 1,649,670,000
PERCENT OF FIRST DECADE	100%	114%	504%	266%	304%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 29 COUNTIES NOT ON CHANNEL OF ARKANSAS RIVER	$ 72,256,000	$ 84,153,000	$ 368,519,000	$ 981,619,000	$ 1,076,600,000
PERCENT OF FIRST DECADE	100%	117%	510%	266%	292%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 8 COUNTIES CROSSED BY CHANNEL OF ARKANSAS RIVER	$ 35,663,000	$ 38,447,000	$ 174,498,000	$ 463,963,000	$ 573,070,000
PERCENT OF FIRST DECADE	100%	108%	476%	266%	328%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 31 COUNTIES COMPRISING WESTERN DIVISION dollars	$ 20,237,000	$ 33,360,000	$ 116,812,000	$ 296,180,000	$ 373,858,000
PERCENT OF FIRST DECADE	100%	165%	577%	254%	320%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 26 COUNTIES NOT ON CHANNEL OF ARKANSAS RIVER	$ 15,342,000	$ 27,150,000	$ 93,734,000	$ 231,895,000	$ 293,505,000
PERCENT OF FIRST DECADE	100%	176%	610%	247%	313%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 5 COUNTIES CROSSED BY CHANNEL OF ARKANSAS RIVER	$ 4,845,000	$ 6,210,000	$ 23,078,000	$ 64,285,000	$ 80,353,000
PERCENT OF FIRST DECADE	100%	128%	476%	279%	350%
PERCENT OF THIRD DECADE			100%		

Colo. Ex. 69

PLATE 29

ASSESSED VALUATIONS of the VARIOUS CLASSES of PROPERTY in KANSAS

PLATE 29

DATA REPORTED BIENNIALLY BY THE KANSAS STATE BOARD OF AGRICULTURE
ARRANGED AND AVERAGED BY C. L. PATTERSON, CIVIL ENGINEER

	County Groups	LANDS.	LOTS	PERSONAL	PUB. SER. CORP.	TOTALS
First Decade 1862-1869	WHOLE STATE	$ 137,281,000	$ 52,685,000	$ 51,072,000	$ 39,074,000	$ 280,032,000
	EASTERN DIVISION	72,544,000	29,621,000	29,491,000	20,260,000	151,876,000
	CENTRAL DIVISION	53,391,000	20,666,000	19,128,000	14,588,000	107,916,000
	WESTERN DIVISION	11,377,000	2,538,000	2,452,000	3,830,000	20,237,000
Second Decade 1864-1900	WHOLE STATE	$ 166,283,000	$ 59,724,000	$ 45,082,000	$ 58,173,000	$ 330,158,000
	EASTERN DIVISION	78,093,000	40,505,000	25,906,000	29,724,000	174,228,000
	CENTRAL DIVISION	66,694,000	17,415,000	16,174,000	22,317,000	122,600,000
	WESTERN DIVISION	21,453,000	1,791,000	2,976,000	7,119,000	33,360,000
Third Decade 1902-1910	WHOLE STATE	$ 617,857,000	$ 200,704,000	$ 245,738,000	$ 203,133,000	$ 1,267,432,000
	EASTERN DIVISION	257,418,000	124,955,000	117,663,000	107,567,000	607,603,000
	CENTRAL DIVISION	291,791,000	69,417,000	107,861,000	73,948,000	543,017,000
	WESTERN DIVISION	68,648,000	6,333,000	20,212,000	21,619,000	116,812,000
Fourth Decade 1912-1920	WHOLE STATE	$ 1,529,896,000	$ 473,895,000	$ 712,250,000	$ 448,138,000	$ 3,164,179,000
	EASTERN DIVISION	607,031,000	271,287,000	311,674,000	232,435,000	1,422,417,000
	CENTRAL DIVISION	754,896,000	185,772,000	336,191,000	169,723,000	1,445,582,000
	WESTERN DIVISION	167,949,000	16,886,000	64,385,000	46,960,000	296,180,000
Fifth Decade 1922-1930	WHOLE STATE	$ 1,732,255,000	$ 627,011,000	$ 743,945,000	$ 559,995,000	$ 3,663,206,000
	EASTERN DIVISION	679,691,000	336,957,000	328,024,000	295,006,000	1,639,678,000
	CENTRAL DIVISION	826,169,000	261,832,000	349,553,000	212,115,000	1,649,670,000
	WESTERN DIVISION	226,429,000	28,217,000	66,368,000	52,849,000	373,858,000

Colo. Ex. 70

Page 17

PLATE 30

ASSESSED VALUATIONS OF THE LANDS IN THE STATE OF KANSAS

DATA REPORTED BIENNIALLY BY COUNTIES BY THE KANSAS STATE BOARD OF AGRICULTURE
THE VALUATIONS OF CITY, PERSONAL, AND UTILITY PROPERTIES NOT INCLUDED

ARRANGED AND AVERAGED BY C. L. PATTERSON, CIVIL ENGINEER

ALL VALUATIONS SHOWN ARE IN DOLLARS AND ARE AVERAGES BY DECADES	FIRST DECADE 1882-1890	SECOND DECADE 1894-1900	THIRD DECADE 1902-1910	FOURTH DECADE 1912-1920	FIFTH DECADE 1922-1930
TOTALS FOR 105 COUNTIES COMPRISING WHOLE STATE OF KANSAS	$ 137,281,000	$ 166,283,000	$ 617,857,000	$ 1,529,896,000	$ 1,732,255,000
PERCENT OF FIRST DECADE	100%	121%	450%	244%	281%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 37 COUNTIES COMPRISING EASTERN DIVISION OF KANSAS	$ 72,584,000	$ 78,093,000	$ 257,418,000	$ 607,051,000	$ 679,691,000
PERCENT OF FIRST DECADE	100%	108%	355%	236%	264%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 37 COUNTIES COMPRISING CENTRAL DIVISION OF KANSAS	$ 58,359,000	$ 66,694,000	$ 291,791,000	$ 754,896,000	$ 826,169,000
PERCENT OF FIRST DECADE	100%	125%	548%	259%	283%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 29 COUNTIES NOT ON CHANNEL OF ARKANSAS RIVER	$ 37,973,000	$ 48,858,000	$ 211,735,000	$ 547,185,000	$ 546,192,000
PERCENT OF FIRST DECADE	100%	129%	560%	253%	281%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 8 COUNTIES CROSSED BY ARKANSAS RIVER CHANNEL	$ 15,386,000	$ 17,836,000	$ 80,056,000	$ 207,711,000	$ 229,977,000
PERCENT OF FIRST DECADE	100%	119%	520%	260%	288%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 31 COUNTIES COMPRISING WESTERN DIVISION OF KANSAS	$ 11,377,000	$ 21,485,000	$ 68,648,000	$ 167,949,000	$ 226,425,000
PERCENT OF FIRST DECADE	100%	189%	603%	245%	330%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 26 COUNTIES NOT ON CHANNEL OF ARKANSAS RIVER	$ 9,175,000	$ 18,182,000	$ 56,259,000	$ 133,583,000	$ 181,448,000
PERCENT OF FIRST DECADE	100%	198%	613%	237%	322%
PERCENT OF THIRD DECADE			100%		
TOTALS FOR 5 COUNTIES CROSSED BY ARKANSAS RIVER CHANNEL	$ 2,202,000	$ 3,301,000	$ 12,389,000	$ 34,366,000	$ 44,960,000
PERCENT OF FIRST DECADE	100%	150%	563%		
PERCENT OF THIRD DECADE					

PLATE 30

POPULATION DATA STATE OF COLORADO
AND
COUNTIES OF SOUTH EASTERN COLORADO
IN BASIN OF THE ARKANSAS RIVER

DATA REPORTED BY U. S. CENSUS BUREAU
TABULATED BY C. L. PATTERSON, CONS. CIVIL ENG.

	AREA SQ. MI.	1930	1920	1910	1905	1900	1890	1880
WHOLE STATE OF COLORADO	103,658	1,035,971	939,629	799,024	669,362	539,700	413,249	194,327
ALL OF STATE EXCEPT 16 COUNTIES IN S. E. COLO. INVOLVED IN ARK. RIVER BASIN	75,119	752,919	670,321	568,384	478,431	388,477	291,609	121,190
ALL 16 COUNTIES OF S. E. COLO. IN ARK RIVER BASIN	28,539	282,872	269,308	230,640	190,931	151,223	121,640	73,137
8 COUNTIES OF S. E. COLO. IN ARK. RIVER BASIN BUT NOT ON MAIN RIVER CHANNEL	17,874	130,693	126,848	107,250	87,456	67,663	52,224	29,056
EL PASO COUNTY	2,121	49,570	44,027	43,321	37,461	31,602	21,339	7,919
LINCOLN COUNTY	2,570	7,850	8,273	5,917	3,422	926	689	-
CHEYENNE COUNTY	1,777	3,723	3,716	3,687	2,094	501	534	-
KIOWA COUNTY	1,798	3,786	3,755	2,899	1,800	701	1,243	-
CUSTER COUNTY	747	2,124	2,472	1,917	2,442	2,937	2,970	8,080
HUERFANO COUNTY	1,500	17,062	16,879	13,320	10,857	8,395	6,882	4,124
LAS ANIMAS COUNTY	4,809	36,008	38,975	33,643	27,743	21,842	17,208	8,903
BACA COUNTY	2,552	10,570	8,721	2,516	1,637	759	1,479	-
8 COUNTIES OF S. E. COLO. ON CHANNEL OF ARK. RIVER	10,665	152,179	142,460	123,390	103,375	83,560	69,396	44,081
LAKE COUNTY	371	4,899	6,630	10,600	14,327	18,054	11,663	23,563
CHAFFEE COUNTY	1,083	8,126	7,753	7,622	7,353	7,085	6,612	6,512
FREMONT COUNTY	1,557	18,896	17,883	18,181	16,909	15,636	9,156	4,735
PUEBLO COUNTY	2,433	66,038	57,638	52,223	43,336	34,148	31,491	7,617
CROWLEY COUNTY	808	5,934	6,383	-	-	-	-	-
OTERO COUNTY	1,259	24,390	22,623	20,201	15,861	11,522	4,192	-
BENT COUNTY	1,524	9,134	9,705	5,043	4,046	3,049	1,313	1,654
PROWERS COUNTY	1,630	14,762	13,845	9,520	6,643	3,766	1,969	-

Page 19

Colo. Ex. 73

RATES OF GAIN IN POPULATION

DURING EARLY PERIOD 1880-1905 AND RECENT PERIOD 1905-1930

C. L. Patterson, Corps Civil Engineer.

	AREA SQ. MI.	POPULATION 1880	GAIN 1880 TO 1905 THOUSANDTHS	GAIN 1880 TO 1905 PERCENT	POPULATION 1905	GAIN 1905 TO 1930 INHABITANTS	GAIN 1905 TO 1930 PERCENT	POPULATION 1930
UNITED STATES	3,026,789	50,155,783	33,327,637	67.2 %	83,483,420	38,740,626	46.2 %	122,775,046
STATE OF KANSAS	82,029	996,096 (a)	670,393	67.0 %	1,544,968	306,056	19.8 %	1,851,024
STATE OF COLORADO	103,658	194,327	478,935	246.0 %	673,262	376,529	56.0 %	1,049,791
21 COUNTIES EAST: KANS.	22,736	249,215	330,260	132.6 %	579,475	72,539	12.5 %	652,014
37 " CENT. "	31,449	349,166	215,632	61.7 %	564,798	158,767	27.8 %	723,565
31 " WEST "	27,484	25,564	68,331	267 %	93,895	83,760	89.0 %	177,645
16 " S.E. COLO.	29,539	23,131	117,764	161 %	140,895	81,981	58.2 %	222,876
CENTRAL KANS.								
19 Co's. SMOKY BASIN	18,723	183,713	71,506	38.9 %	255,222	11,947	2.8 %	267,169
18 " INSIDE "	15,884	166,133	148,123	89.2 %	314,276	147,680	47.0 %	461,956
10 " OFF CHANNEL	8,363	76,379	53,962	70.5 %	130,481	27,311	20.9 %	157,852
8 " CHN. "	7,883	89,376	90,721	101.5 %	179,795	128,309	71.5 %	308,104
WESTERN KANS.								
17 Co's. OUTSIDE BASIN	15,798	77,806	88,883	253 %	43,287	42,736	122.5 %	108,943
14 " INSIDE "	11,884	31,750	123,172	388 %	32,872	41,636	133 %	71,902
9 " OFF CHANNEL	6,689	8,932	11,582	248 %	18,514	12,349	96 %	28,863
8 " CHN. "	5,117	2,768	11,896	361 %	15,344	27,675	180 %	43,019
ARK. RIVER BASIN CENT. & WEST. COLO.								
24 Co's. OUTSIDE BASIN	21,621	201,381	116,812	58.2 %	318,193	67,783	18.9 %	385,976
32 " INSIDE "	27,332	173,855	167,501	96.5 %	341,356	188,334	58.2 %	529,690
19 " OFF CHANNEL	15,082	30,511	65,874	218 %	145,985	32,720	22.1 %	178,705
13 " CHN. "	12,300	93,342	101,817	109.1 %	195,159	147,984	75.8 %	343,143
ARK. RIVER BASIN SOUTHEAST COLO.								
27 Co's. OUTSIDE BASIN	18,119	121,180	237,241	195 %	358,421	294,493	57.8 %	652,914
16 Co's. INSIDE "	23,532	73,187	117,744	161 %	190,931	91,941	48.2 %	282,872
8 Co's. OFF CHANNEL	11,576	28,036	28,600	201 %	57,636	93,237	44.8 %	150,873
5 " CHN. "	10,663	29,251	29,364	135 %	103,615	68,756	47.9 %	158,371
5 " " "								
LOWER ARK. RIVER	7,454	9,231	22,418	600 %	26,986	58,562	98 %	122,258

(a) DATA FOR KANSAS YEAR 1885

Colo. Ex.

ACRES OF FIELD CROPS HARVESTED
DURING THE SEASONS OF 1924-1930.
IN THE STATE OF COLORADO AND THE COUNTIES OF ARKANSAS RIVER BASIN.

DATA REPORTED BY COLORADO CO-OPERATIVE CROP REPORTING SERVICE
UNITED STATES DEPT OF AGRICULTURE - BUREAU OF AGRICULTURAL ECONOMICS.

Arranged and Averaged by G. L. PATTERSON, Cons. Civil Eng.

		ACRES OF FIELD CROPS HARVESTED DURING SEASONS SHOWN BELOW								AVERAGE NUMBER OF ACRES OF FIELD CROPS HARVESTED PER SQ. MI. OF AREA
	AREA SQ. MI.	1930 ACRES	1929 ACRES	1928 ACRES	1927 ACRES	1926 ACRES	1925 ACRES	1924 ACRES	AVERAGE DURING SEVEN YEAR PERIOD	
WHOLE STATE OF COLORADO	103,658	7,222,530	6,810,920	6,342,100	6,573,000	6,600,000	6,140,000	6,336,000	6,574,930	64
16 COUNTIES S.E. COLO.	28,539	1,305,165	1,632,945	1,385,616	1,347,500	1,555,940	1,402,600	1,543,140	1,554,405	54
8 COUNTIES ARK. RIVER BASIN S.E. COLO. NOT ON CHANNEL OF ARK. RIVER	17,874	1,245,080	1,098,735	916,390	1,014,900	1,029,100	917,500	976,400	1,028,295	58
EL PASO COUNTY	2,121	189,830	172,980	149,250	184,500	180,200	167,000	186,000	175,680	83
LINCOLN "	2,570	265,505	270,120	279,490	252,000	248,000	224,000	223,000	251,730	98
CHEYENNE "	1,777	145,345	128,365	120,736	153,500	146,000	125,000	127,000	135,135	76
KIOWA "	1,798	111,740	90,620	96,000	96,800	105,000	94,000	84,000	96,880	54
CUSTER "	747	28,705	25,495	30,443	29,500	17,900	24,200	21,400	25,380	34
HUERFANO "	1,500	34,385	38,565	28,052	41,800	41,000	34,300	29,000	35,300	24
LAS ANIMAS "	4,804	103,500	94,845	52,180	64,800	90,000	78,000	95,000	82,900	17
BACA "	2,552	366,070	275,745	160,240	192,000	201,000	171,000	211,000	225,290	88
8 COUNTIES ON ARK. RIVER IN SOUTH EAST COLORADO	10,665	560,085	534,210	469,226	533,600	526,840	485,100	566,740	526,110	49
LAKE COUNTY	271	5,095	5,165	7,510	3,000	4,990	4,500	3,840	4,870	18
CHAFFEE "	1,083	18,690	18,850	20,465	19,400	19,850	17,500	19,500	19,180	18
FREMONT "	1,557	25,445	24,545	21,434	21,500	19,500	17,800	24,400	22,090	14
PUEBLO "	2,433	105,530	99,438	101,234	112,200	110,500	101,500	108,800	105,600	43
CROWLEY "	808	54,675	50,030	57,946	75,500	55,700	45,800	56,700	56,620	70
OTERO "	1,259	82,970	77,845	71,023	75,400	80,600	78,000	85,000	78,690	63
BENT "	1,524	97,020	89,585	78,250	80,100	77,700	73,000	97,500	84,730	56
PROWERS "	1,630	170,660	168,755	111,364	146,500	158,000	147,000	171,000	153,330	94
5 COUNTY - PUEBLO, CROWLEY, OTERO, BENT AND PROWERS - TOTALS	7,654	510,855	485,650	419,817	489,700	482,500	445,300	519,000	478,970	62

Colo. Exp. 75

PLATE 33

ACRES OF FIELD CROPS HARVESTED

AVERAGE SEASON OF SEVEN YEAR PERIOD 1924-30

Arranged and Averaged by C. L. PATTERSON, Cons. C.E.

SUB-DIVISION	DATA FOR THE KANSAS AREAS			DATA FOR THE COLORADO AREAS		
	AREA SQ. MI.	FIELD CROPS HARVESTED ACRES	ACRES OF CROPS PER SQ. MI OF AREA	AREA SQ. MI.	FIELD CROPS HARVESTED ACRES	ACRES OF CROPS PER SQ. MI. AREA
STATE OF KANSAS	82,079	22,234,600	271			
STATE OF COLORADO				103,658	6,574,930	64
37 COUNTIES EAST. KANSAS	22,756	5,457,700	240			
32 COUNTIES CENT. "	31,669	10,701,300	338			
31 COUNTIES WEST. "	27,604	6,075,600	220			
16 COUNTIES S.E. COLORADO				28,529	1,554,405	54
32 COUNTIES ARK. RIVER BASIN CENT. & WEST. KANS.	27,752	7,948,400	286			
13 COUNTIES ON ARK. RIVER IN CENT. & WEST. KANSAS	12,700	3,833,600	302			
8 COUNTIES ON ARK. RIVER IN SOUTH EAST COLORADO				10,665	526,110	49
5 COUNTIES ON ARK. RIVER IN WESTERN KANSAS	5,117	970,900	190			
5 COUNTIES ON ARK. RIVER IN SOUTH EAST COLORADO				7,654	478,970	62

PLATE 34

PLATE 34

VALUES OF THE FIELD CROPS HARVESTED
DURING THE SEASONS OF 1924-1930.
IN THE STATE OF COLORADO AND THE COUNTIES OF THE ARKANSAS RIVER BASIN

DATA REPORTED BY COLORADO CO-OPERATIVE CROP REPORTING SERVICE
UNITED STATES DEPT OF AGRICULTURE - BUREAU OF AGRICULTURAL ECONOMICS.

Arranged and Averaged by C. L. PATTERSON, Cons. Civil Eng.

	AREA	VALUES OF THE FIELD CROPS HARVESTED DURING THE YEARS SHOWN BELOW								AVERAGE
	SQUARE MILES	1924 Dollars	1925 Dollars	1926 Dollars	1927 Dollars	1928 Dollars	1929 Dollars	1930 Dollars	AVERGE OF 7-YR. PERIOD	Dollars PER SQ. MI.
WHOLE STATE OF COLORADO	103,658	132,015,097	137,630,000	120,969,000	132,316,000	116,758,000	134,537,170	124,442,520	129,381,000	$ 1,238
16 COUNTIES OF S.E. COLO.	28,539	27,769,755	23,552,771	20,552,771	24,953,070	23,358,940	28,611,810	27,408,930	25,152,400	882
8 COUNTIES OF S.E. COLO. IN ARK. RIVER BASIN NOT ON CHANNEL OF ARK. RIVER	17,874	10,999,330	10,395,331	7,103,634	10,319,930	9,495,190	11,835,230	11,642,250	10,235,700	575
EL PASO COUNTY	2,121	2,113,465	2,445,067	1,506,728	2,498,830	1,874,650	1,834,960	2,394,970	2,095,500	990
LINCOLN "	2,570	2,841,890	2,543,600	1,925,362	2,757,210	2,632,800	1,999,310	2,189,250	2,412,800	940
CHEYENNE "	1,777	1,333,935	1,231,902	563,494	885,470	1,031,090	1,015,470	1,485,520	1,078,100	607
KIOWA "	1,798	849,674	817,344	429,218	715,520	848,930	926,020	1,128,120	816,400	455
CUSTER "	747	535,523	569,768	357,870	482,180	488,010	596,520	727,760	521,100	700
HUERFANO "	1,500	503,625	588,594	566,819	598,230	473,800	637,080	419,120	541,000	360
LAS ANIMAS "	4,809	1,105,748	1,072,839	861,402	839,210	779,060	1,542,370	1,075,540	1,039,400	216
BACA "	2,552	1,715,420	1,126,217	892,741	1,543,280	1,336,850	3,283,500	2,221,970	1,731,400	880
8 COUNTIES ON ARK. RIVER IN SOUTH EAST COLORADO	10,665	16,770,425	13,157,440	13,449,024	14,633,140	13,863,750	16,776,580	15,766,680	14,916,200	1,400
LAKE COUNTY	371	88,217	101,021	45,070	25,200	70,470	48,740	58,240	62,400	173
CHAFFEE "	1,083	522,108	541,926	564,005	612,400	541,710	467,880	390,850	520,100	480
FREMONT "	1,557	1,288,561	1,054,442	956,816	1,074,740	948,870	944,370	921,800	1,027,100	660
PUEBLO "	2,433	2,556,314	2,325,500	2,009,997	2,736,340	2,998,540	2,890,390	3,055,680	2,653,300	1,090
CROWLEY "	808	2,149,801	1,555,837	2,110,403	2,070,010	2,039,120	2,178,670	2,322,300	2,060,900	2,550
OTERO "	1,259	4,380,057	3,497,510	3,849,198	3,565,060	3,450,310	4,267,990	4,029,520	3,862,800	3,070
BENT "	1,524	2,210,618	1,347,939	1,336,241	1,940,370	1,872,540	2,485,760	2,313,600	1,929,600	1,266
PROWERS "	1,630	3,574,543	2,733,165	2,577,294	2,609,020	1,942,190	3,492,980	2,674,640	2,800,[illegible]00	1,720
PUEBLO, CROWLEY, OTERO BENT AND PROWERS CO. 5 COUNTY TOTALS	7,654	14,871,539	11,460,051	11,883,133	12,920,800	12,302,700	15,315,590	14,395,790	13,307,100	1,740

Colo. Ex. 77

PLATE 35

AVERAGE VALUES OF FIELD CROPS HARVESTED

DURING THE SEVEN YEAR PERIOD 1924-30

Arranged and Averaged by C.L. PATTERSON, Cons. C.E.

	DATA FOR THE KANSAS AREAS			DATA FOR THE COLORADO AREAS		
	AREA SQ. MI	VALUE OF FIELD CROPS AVGE. 1924-30 DOLLARS	VALUE OF CROPS PER SQ. MI. OF AREA	AREA SQ. MI.	VALUE OF FIELD CROPS AVGE 1924-30 DOLLARS	VALUE OF CROPS PER SQ. MI. OF AREA
STATE OF KANSAS	83,029	$ 314,775,000	$ 3,813			
STATE OF COLORADO				103,658	$ 128,381,000	$ 1,238
37 COUNTIES-EAST. KANS.	22,756	92,503,000	4,065			
37 Co. " CENT. "	31,664	152,170,000	4,805			
31 " WEST. "	27,604	70,102,000	2,540			
16 COUNTIES S.E. COLO.				29,539	25,171,000	882
32 COUNTIES ARK. RIVER BASIN CENT. & WEST. KANS	27,752	112,590,000	4,050			
13 COUNTIES ON ARK RIVER IN CENT. & WEST. KANS.	12,700	56,921,000	4,482			
8 COUNTIES ON ARK. RIVER IN SOUTH EAST. COLORADO				10,665	14,915,000	1,400
5 COUNTIES ON ARK. RIVER IN WESTERN KANSAS	3,117	14,126,000	2,760			
5 COUNTIES ON ARK. RIVER IN SOUTH EAST COLORADO				7,654	13,307,100	1,740

PLATE 34

ASSESSED VALUATIONS OF THE COUNTIES OF SOUTH EASTERN COLORADO

FOR THE YEARS 1921 TO 1930

AS REPORTED BY THE STATE TAX COMMISSION

COMPILED BY C. L. PATTERSON, Cons. Civil Eng.

DATA SHOWN TO NEAREST THOUSAND DOLLARS AND THREE ZEROS OMITTED

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	TEN YEAR AVERAGE
STATE OF COLORADO	1,573,256	1,548,618	1,543,590	1,538,097	1,540,732	1,546,830	1,565,291	1,577,560	1,586,925	1,586,465	1,561,256
16 COUNTIES OF ARK RIVER BASIN IN S.E. COLORADO	401,490	396,539	394,144	391,265	389,915	387,406	392,451	394,686	397,079	396,431	394,144
8 COUNTIES ON TRIBUTARIES OF THE ARKANSAS RIVER	203,619	202,047	200,342	198,157	196,702	193,362	197,205	196,936	197,446	196,001	198,242
EL PASO COUNTY	69,400	69,479	70,057	70,661	70,999	70,612	72,057	73,307	73,323	73,327	71,747
LINCOLN "	24,584	23,431	23,518	23,145	22,624	21,765	20,952	20,503	20,406	18,385	21,515
CHEYENNE "	20,513	20,647	19,574	18,303	16,938	16,787	15,719	15,570	13,784	13,354	17,199
KIOWA "	15,423	15,080	14,402	14,161	14,354	13,669	13,585	13,481	13,187	13,005	14,015
CUSTER "	3,119	3,093	3,112	3,097	3,114	3,081	3,093	3,204	3,096	3,075	3,104
HUERFANO "	16,068	15,775	15,904	16,141	15,960	16,030	17,372	17,163	16,606	16,068	16,369
LAS ANIMAS "	43,748	43,669	43,448	42,940	42,308	41,892	42,072	40,834	41,622	41,974	42,450
BACA "	10,964	10,673	10,465	9,311	10,005	10,048	12,572	12,334	13,390	14,219	11,503
8 COUNTIES ON MAIN CHANNEL OF ARKANSAS RIVER	197,871	194,492	193,802	193,128	193,611	193,544	195,232	197,660	199,633	200,430	195,902
LAKE COUNTY	8,932	8,251	8,087	7,744	7,707	7,680	7,879	8,055	7,610	7,487	7,942
CHAFFEE "	10,394	10,148	10,567	10,590	10,490	10,557	9,316	9,439	9,611	9,359	10,212
FREMONT "	21,693	21,177	21,578	21,471	21,497	21,423	21,770	23,589	23,383	22,872	22,045
PUEBLO "	71,145	71,849	72,717	73,446	74,264	75,663	77,714	79,997	81,298	83,025	76,108
CROWLEY "	11,957	11,671	9,545	9,809	9,799	9,699	9,925	10,002	10,185	9,744	10,234
OTERO "	34,123	33,200	33,703	33,694	34,446	33,631	33,388	31,827	32,014	32,119	33,210
BENT "	15,023	14,331	13,946	13,512	13,588	13,446	13,712	13,430	13,742	13,760	13,814
PROWERS "	24,106	23,239	23,156	22,862	21,770	21,545	21,530	21,173	21,832	21,564	22,277
4 COUNTIES ON LOWER ARK RIVER IN S.E. COLORADO, CROWLEY, OTERO, BENT, AND PROWERS COUNTIES	85,209	82,481	80,365	79,677	79,465	79,221	78,568	76,632	77,775	77,187	79,985

PLATE 37

COMPARATIVE DATA AS TO TOTAL ASSESSED VALUATIONS IN KANSAS AND COLORADO, AND PORTIONS OF EACH STATE

AVERAGE VALUATIONS PERIOD 1921-1930

DATA REPORTED BY THE STATE TAX COMMISSIONS

COMPILED BY C. L. PATTERSON, CONS. C.E.

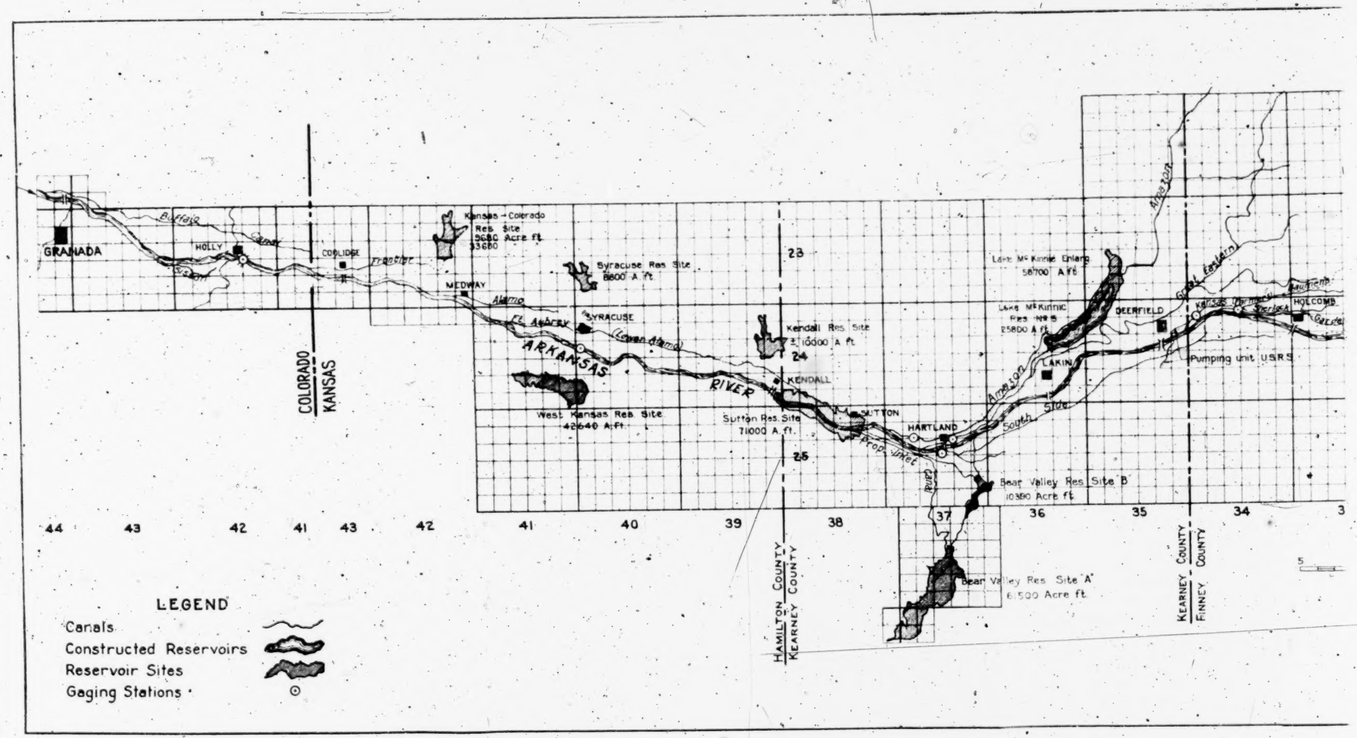
	DATA FOR THE KANSAS AREAS			DATA FOR THE COLORADO AREAS		
	AREA SQ. MI.	ASSESSED VALUATIONS PERIOD AVERAGE - DOLLARS	ASSESSED VALUATION PER SQ. MI. OF AREA	AREA SQ. MI.	ASSESSED VALUATIONS PERIOD AVERAGE - DOLLARS	ASSESSED VALUATION PER SQ. MI. OF AREA
STATE OF KANSAS	82,029	$ 3,663,206,000	$ 44,657			
STATE OF COLORADO				103,658	$ 1,561,236,000	$ 15,061
37 COUNTIES EAST. KANS.	22,756	$ 1,639,678,000	72,055			
37 COUNTIES CENT. KANS.	31,669	$ 1,649,670,000	$ 52,090			
31 COUNTIES WEST. KANS.	27,604	$ 373,858,000	$ 13,543			
16 COUNTIES S.E. COLO.				28,539	$ 394,144,000	$ 13,807
13 COUNTIES ON ARK. RIVER IN CENT. AND WEST. KANS.	12,760	$ 653,450,000	$ 51,451			
8 COUNTIES ON ARK. RIVER IN SOUTH EAST. COLORADO				10,665	$ 195,902,000	$ 18,369
HAMILTON, KEARNEY, FINNEY, GRAY AND FORD COUNTIES ON ARK. RIVER IN WEST. KANS.	5,117	$ 80,353,000	$ 15,703			
CROWLEY, OTERO, BENT, AND PROWERS COUNTIES ON ARK. RIVER IN S.E. COLO.				5,221	$ 79,595,000	$ 15,245

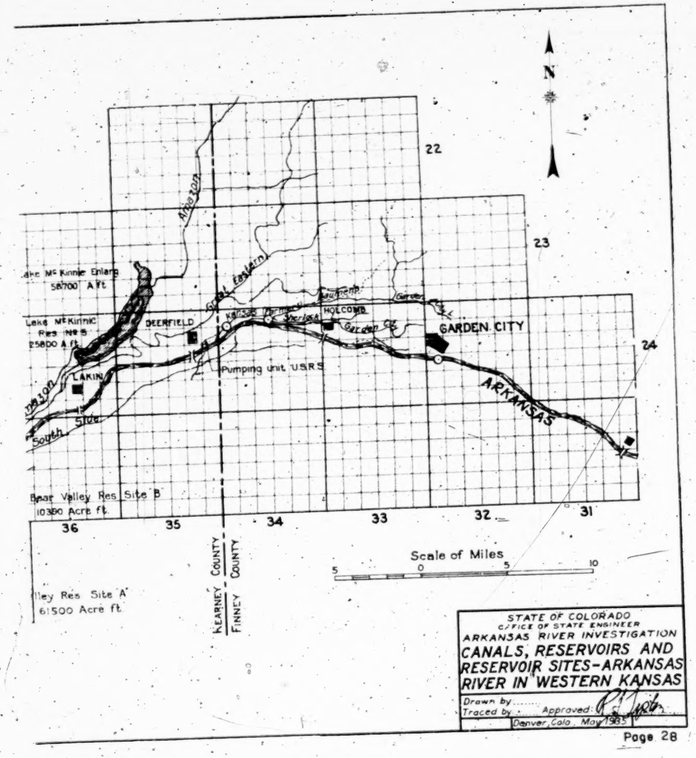
TABLE 8.—*Monthly and seasonal net irrigation requirements of the various subdivisions of the Missouri and Arkansas River Basins*

Number of division	Description of division	Monthly percentage of total seasonal net irrigation requirements							Seasonal net irrigation requirement, in acre-feet per acre
		Apr.	May	June	July	Aug.	Sept.	Oct.	
1	Northeastern Montana	.....	6	37	36	20	.....	[1] 1	1.40
2	North central Montana	.....	6	41	31	21	.....	[1] 1	1.50
3	Central Montana	.....	3	32	44	20	.....	[1] 1	1.70
4	Upper Missouri River Basin in Montana	.....	3	34	47	15	.....	[1] 1	1.60
5	Upper Yellowstone River Basin in Montana	.....	4	33	45	17	.....	[1] 1	1.90
6	Southeastern Montana	.....	5	31	39	20	4	[1] 1	1.95
7	Big Horn River Basin in Wyoming	.....	4	33	43	16	3	[1] 1	1.65
8	Yellowstone and Missouri River Basin in Wyoming	.....	6	32	41	18	2	[1] 1	1.70
9	Upper Platte River Basin in Wyoming	.....	3	35	44	15	2	[1] 1	1.60
10	Northeastern Colorado	1	14	27	28	19	7	[1] 1	2.05
11	North central Colorado	2	11	29	30	20	7	[1] 1	2.20
12	South central Colorado	6	15	28	29	18	3	[1] 1	2.10
13	Southeastern Colorado	8	20	23	24	19	4	[2] 2	2.30
14	Western Kansas	4	14	25	26	20	7	[2] 4	1.75
15	Central Nebraska	3	10	24	32	20	8	[2] 3	1.25
16	Western Nebraska	2	8	23	28	25	12	[2] 2	2.00
17	Western South Dakota	1	4	27	34	23	10	[1] 1	1.50
18	Western North Dakota	.....	3	35	38	22	1	[1] 1	1.35

[1] Winter irrigation. [2] Mainly winter irrigation.

One of the principal influences affecting the seasonal irrigation requirements of this area is the shortness of the period in which water is applied to crops. In general, the use of water on alfalfa covers the longest period, but even this is short when compared with its duration on other main river basins of the West. In irrigating 275 plots of alfalfa located in several localities of southern Alberta over a number of years, 15 per cent of the total seasonal application was made in May, 29 per cent in June, 33 per cent in July, 22 per cent in August, and only 1 per cent in September. In irrigating small grain the season is shorter. In a total of 758 plots of wheat, oats, and barley grown in southern Alberta 2 per cent of the water application was made in May, 44 per cent in June, 46 per cent in July, 8 per cent in August, and none in September. In irrigating 62 fields of alfalfa in the Yellowstone Valley, Mont., 11 per cent of the total application was made in May, 25 per cent in June, 35 per cent in July, 26 per cent in August, and 3 per cent in September. In irrigating 48 fields of wheat and oats in the same valley, 49 per cent of the application was made in June, 50 per cent in July, and 1 per cent in August. In the Arkansas Valley of Colorado the growing season is longer, water occasionally being applied in March and as late as October, with correspondingly smaller quantities in June and July. In a total of 132 field experiments on diversified crops in the Arkansas Valley, 2 per cent of the water application was made near the end of March, 8 per cent in April, 20 per cent in May, 23 per cent in June, 22 per cent in July, 19 per cent in August, 4 per cent in September, and 2 per cent in October.





STATE OF COLORADO
OFFICE OF STATE ENGINEER
ARKANSAS RIVER INVESTIGATION

CANALS, RESERVOIRS AND RESERVOIR SITES-ARKANSAS RIVER IN WESTERN KANSAS

Drawn by
Traced by
Approved
Denver, Colo. May 1933

TABULATION SHOWING FLOW OF ARKANSAS RIVER AT PUEBLO, COLO., AND HOLLY, COLO., AND NATURAL CONTRIBUTIONS OF TRIBUTARIES, ALSO QUANTITIES CONSUMED AND UNCONSUMED

Data Extracted From Co-operative Investigation (Amsley) Reports (1922-1925) and Compiled by C. L. Patterson, Engineer.

	THE YEAR 1922 (Acre-feet)		THE YEAR 1923 (Acre-feet)		THE YEAR 1924 (Acre-feet)		THE YEAR 1925 (Acre-feet)	
1 ARKANSAS RIVER AT PUEBLO		469700		731300		568000		323630
2 PUEBLO-SEWER	17809		23210		20340		17290	
3 C.F.&I. - SALT CREEK	19902		24810		24968		23628	
4 BESSEMER DIVERSIONS	65740		67396		74200		59402	
5 SUM OF BY-PASSED AMOUNTS		103451		113418		119508		120320
6 ARK. RIVER AT HEAD-OF AREA		573151		846716		687508		423950
NATURAL FLOW TRIBUTARIES								
FOUNTAIN RIVER	18690		87625		44358		15921	
SALT CR. (Item 3)	19902		24810		24968		23628	
PUEBLO SEWER (Item 2)	17809		23210		28340		17290	
ST. CHARLES RIVER	4800		54565		27960		16537	
HUERFANO RIVER	5179		43752		20568		10269	
Chicosa Creek	130		(a)		(a)		215	
APISHAPA RIVER	5910		51290		7509		15660	
TIMPAS CREEK	7576		47000		9319		19328	
Crooked Arroya	1295		4055		710		5794	
Anderson Arroya	290		2000		262		830	
King Arroya	625		(a)		(a)		(a)	
Misc. Pueblo-La Junta (a)	2400(E)		14000(E)		1000(E)		18137(E)	
HORSE CREEK	19725		(b)		31004		9066	
ADOBE CREEK	4130		(b)		2000(E)		12256	
PURGATOIRE RIVER	22360		387310		52809		87166	
Ruie Creek	2111		3268		906		13710	
Caddoa Creek	1011		2993		231		17892	
Mud Creek	1049		5014		206		29882	
Clay Creek	1417		6000		595		9029	
BIG SANDY	10520		(b)		10758		7339	
Buffalo Creek	1410		3440		1810		2046	
Two Buttes Creek	0		10023		0		17260	
Wild Horse Creek	0		11209		3989		3387	
Misc. La Junta-Holly (b)	0		51000(E)		2000(E)		21000(E)	
7 SUM TRIBUTARY ITEMS	148174		832566		234558		373572	
Less By-Passed Items 2 & 3	37711		48020		45308		40918	
8 TRIBUTARY CONTRIBUTIONS		110463		784546		189250		332654
9 TOTAL ORIGINAL SUPPLY		683614		1631362		876758		756604
ARK. RIVER AT HOLLY	93687		800780		268718		231368	
Wild Horse Creek	7313		15489		6693		8307	
Holly Drain (Inc. Cheyenne Cr)	-		7914		23843		22610	
10 UNCONSUMED OUTFLOW		101000		824183		299254		262285
11 CONSUMED RIVER FLOW		582614		807179		577504		494319
IN STORAGE JAN. 1	93638		34000		291514		96860	
do DEC. 31	34000		291514		96860		63575	
12 CONSUMED RES. WATER		59638		-257514		194654		33294
13 TOTAL WATER CONSUMED		642252		549665		772158		527613
14 ACREAGE IRRIGATED (Acres)		310000		325000		321424		329572

IN THE SUPREME COURT OF THE UNITED STATES

Original Case.

THE STATE OF COLORADO,

Complainant,

vs.

THE STATE OF KANSAS, and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation,

Defendants.

STIPULATION

THIS STIPULATION made and entered into this 18th day of December, 1933, by and between the State of Colorado, complainant herein, for and on its own behalf and on behalf of its citizens, its administrative officials and all ditch companies in the Arkansas River Basin, which are now or which may hereafter be diverting water from the flow of the Arkansas River, herein designated as first parties and complainant, and the State of Kansas on its own behalf and the Finney County Water Users Association, defendants herein, the State of Kansas acting on behalf of its citizens, its administrative officials and ditch companies, which are now or which may be hereafter diverting water from the flow of the Arkansas River.

WITNESSETH, That Whereas the above entitled case, now pending in the Supreme Court of the United States, includes a controversy between the State of Kansas and the State of

Colorado as to the division and the use of the water supply of the Arkansas River, and the final submission of the case to the Court and the entry of decree therein will not be practicable to be reached for sometime in the future, and

WHEREAS there is under consideration by and on behalf of the United States of American the question whether it shall construct a dam across the main channel of the Arkansas River near the town of Caddoa, Colorado, some fifty miles West from the Kansas-Colorado line, to create a water reservoir upon and near the Arkansas River by means of said dam, which reservoir will probably have a capacity of about 680,000 acre feet of water, and

WHEREAS it is thought by the parties hereto that the construction and maintenance of such dam and reservoir, in addition to regulating the flow of water in the Arkansas River in order to guard against or lessen the damage from floods, will enable much of the water that flows in said river past the location of said proposed dam to be stored, regulated and conserved for beneficial use, and

WHEREAS the parties hereto, their officials, ditch owners and water users, recognizing the advantages which will accrue from the construction of said dam and reservoir are willing to cooperate in attempting to bring about such construction by the United States Government if assured of the protection not only to all rights which they now have and which are involved in the present controversy, but also to their existing water supply in the event said dam should be constructed and put in operation prior to a decree being entered in the Supreme Court of the United States, adjudicating

the respective rights of the parties hereto; and

WHEREAS it is desired to provide for the cooperation of the State of Kansas and the State of Colorado for the use of their influence towards obtaining the construction of such dam and the creation of such reservoir by the United States of America, and to provide, as far as the said two States may, by this Stipulation, for the allocation between the two States of the water which might be stored in such reservoir, so far as such water can be made available for beneficial use in Colorado and Kansas;

And it is also desired to secure the cooperation of the defendant herein, The Finney County Water Users' Association, for all of the purposes covered by this Stipulation;

NOW, THEREFORE, it is stipulated and agreed by and between the parties hereto as follows:

1. Each of said States and also the said The Finney County Water Users' Association, will use its influence so far as it is practicable to obtain the construction by the United States of America of said dam and reservoir, and said parties agree as between themselves to the allocation of the water that might be stored in said reservoir, as hereinafter set forth; it being understood that such allocation shall be subject to the storage and discharge of water stored in such reservoir by the United States of America in order to lessen or avoid damages from floods.

2. That the construction and operation of said dam and reservoir shall not disturb the status quo of the diversion of water for beneficial uses from said Arkansas River by the

ditches and canals now constructed and operated in both of the States of Colorado and Kansas. IT IS UNDERSTOOD AND AGREED that in order to maintain the status quo of said diversion as hereinabove referred to there shall be allocated to the State of Kansas for delivery at the State line in the Arkansas River from Colorado into Kansas a quantity of water up to 77,000 acre feet annually, of which amount 52,000 acre feet thereof shall be delivered to the State line during the irrigation season from April 1 to October 1 of each year as and when required by the Kansas State water officials, and 25,000 acre feet thereof to be delivered during the non-irrigating season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for irrigation or storage; and for irrigation of lands in Colorado below said reservoir a quantity of water up to 160,000 acre feet annually.

3. If the flow of water in the Arkansas River into the reservoir, and into the Arkansas River below the reservoir from other sources than the reservoir shall be insufficient to supply the total amount allocated as provided in paragraph 2 hereof; then in that event the said waters shall be pro rated between Colorado and Kansas in the relation hereinabove in paragraph 2 hereof set forth.

4. After the allocation of water as provided in the next preceding paragraphs, all additional water which may be impounded in said reservoir, excepting, always the amounts of water discharged for flood control purposes, hereinafter referred to, shall constitute surplus and shall be allocated one-half to Colorado and one-half to Kansas, said surplus to be determined April 1, annually, or such other date as may be mutually agreed upon by water officials of the two States, and the amount allocated to each State shall be discharged from said reservoir from time

to time on request of the Water Officials of each State respectively for the water allocated to it, but the release of such water on demand shall not be considered as constituting any part of the amounts specified in paragraph 2 herein.

5. All exchanges of water between the Colorado ditches whose headgates are below said reservoir and those whose headgates are above said reservoir shall be confined and limited to, and supplied from Colorado's portion of the surplus waters stored in said reservoir, as provided for in paragraph 4 hereof, and all such exchanges shall be charged against Colorado's share of the surplus in ascertaining the 50-50 division between the two states.

6. Any water releases from said reservoir for flood control or because of lack of reservoir capacity shall not be charged to either State unless such releases are coincident with the request for water on behalf of said State or the use and diversion by the ditches in such State, and then only to the extent of the request or use so made by it, in which event it shall be charged against the State so requesting or using the amount so requested or diverted.

7. The provisions in this Stipulation for allocation of flow of water shall become effective when such dam shall have been constructed and water begun to be stored in said reservoir.

8. This Stipulation is without prejudice to the claims of either party hereto in the above entitled case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties hereto

to water flowing in the Arkansas River, or stored in said reservoir.

9. That joint control, regulation and administration of the storage and discharge of all waters in said dam and reservoir shall be had by and between Kansas and Colorado.

10. This Stipulation shall not be filed in this action until the construction of said dam and reservoir by the United States Government shall be assured.

Paul P. Prosser
Attorney General of Colorado

A. W. McHendrie

Henry L. Kidd
Solicitors for Complainant

Attorney General of Kansas

John G. Egan
Chester I. Long W. E. Stanley

Solicitors for Defendants

Approved:

Governor, State of Colorado

State Engineer of Colorado

Approved:

Governor of Kansas

Chief Division of Water Resources,
State of Kansas

Table of Contents

DIVERSION DATA

AVERAGE MONTHLY AND ANNUAL DIVERSIONS IN ACRE FEET
FROM MAIN ARKANSAS RIVER IN COLORADO - SEGREGATIONS BY STREAM SECTIONS
for years of record prior to 1931, from
official reports of Division Engineer, Irrigation Division No. 2

MONTHLY AND ANNUAL DIVERSIONS IN ACRE FEET
FROM MAIN ARKANSAS RIVER IN COLORADO - SEGREGATIONS BY STREAM SECTIONS
FOR YEARS 1931-1941 INCLUSIVE
from
official reports of Division Engineer, Irrigation Division No. 2

CALCULATED AVERAGE MONTHLY AND ANNUAL DIVERSIONS IN ACRE FEET
FROM MAIN ARKANSAS RIVER IN COLORADO - SEGREGATIONS BY STREAM SECTIONS
FOR THE PERIOD OF YEARS FOLLOWING 1930

Stream Sections include:

Stream Section	Page
Parkdale to La Junta Section	3
La Junta to Caddoa Section	3
Caddoa to Stateline Section	3

AVERAGE MONTHLY AND ANNUAL DIVERSIONS IN ACRE FEET
FROM ARKANSAS RIVER IN KANSAS - STATELINE TO GARDEN CITY
for years of record prior to 1931, from
Water Bailiff's Reports, 1915-1925; Surface Waters of Kansas, 1921-1924;
Reports of Kansas Irrigation Commissioner, 1921-1926;
Kansas State Board of Agric., Division of Water Resources, 1924-1930

MONTHLY AND ANNUAL DIVERSIONS IN ACRE FEET
FROM ARKANSAS RIVER IN KANSAS - STATELINE TO GARDEN CITY
FOR YEARS 1931-1939 INCLUSIVE
from
U.S.G.S. Water Supply Papers and Reports of Kansas State Board of Agric.,
Division of Water Resources

CALCULATED AVERAGE MONTHLY AND ANNUAL DIVERSIONS IN ACRE FEET
FROM ARKANSAS RIVER IN KANSAS - STATELINE TO GARDEN CITY
FOR THE PERIOD OF YEARS FOLLOWING 1930

Stream Section	Page
Stateline to Garden City Section	4

Table of Contents (Cont'd)

AVERAGE MONTHLY AND ANNUAL TRANSMOUNTAIN DIVERSIONS IN ACRE FEET FROM COLORADO AND GUNNISON RIVER BASINS INTO ARKANSAS RIVER BASIN for years of record prior to 1931, from Kansas Exhibit No. 21

MONTHLY AND ANNUAL TRANSMOUNTAIN DIVERSIONS IN ACRE FEET FROM COLORADO AND GUNNISON RIVER BASINS INTO ARKANSAS RIVER BASIN FOR YEARS 1931-1940 INCLUSIVE

from

Official records of Colorado State Engineer

CALCULATED AVERAGE MONTHLY AND ANNUAL TRANSMOUNTAIN DIVERSIONS IN ACRE FEET FROM COLORADO AND GUNNISON RIVER BASINS INTO ARKANSAS RIVER BASIN FOR THE PERIOD OF YEARS FOLLOWING 1930

Diversions include:

Diversion	Page
Busk-Ivanhoe Tunnel	5
Ewing Ditch	5
Fremont Pass Ditch	5
Columbine Ditch	5
Hurtz Ditch	6
Independence Pass (Twin Lakes) Tunnel	6
Larkspur (Marshall Pass) Ditch	6
Summary of Transmountain Diversions into Arkansas River Basin	6

COLORADO WATER CONSERVATION BOARD - Engineering Department

MONTHLY AND ANNUAL DIVERSIONS IN ACRE FEET
FROM MAIN ARKANSAS RIVER IN COLORADO
SEGREGATIONS BY STREAM SECTIONS

r of Data — State of Colorado - Official Reports, Division Engineer, Division No. 2.
Handwritten figures are calculated values.

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL	PERCENT OF 1930 AVGE.
						PARKDALE TO LA JUNTA SECTION								
30	39,255	40,698	45,969	54,899	101,529	147,417	125,087	110,012	64,852	55,444	52,145	44,449	881,750	100
	39,804	41,110	52,806	52,213	98,569	88,381	56,114	41,979	33,311	39,600	35,994	34,900	614,783	70
	33,578	31,872	35,095	38,580	68,097	118,391	109,564	76,307	46,716	41,816	44,512	28,125	672,453	76
	28,924	22,745	33,882	35,017	89,060	161,110	91,718	91,792	57,374	40,163	43,699	49,062	744,516	84
	46,008	40,202	41,396	40,732	67,780	50,593	40,665	39,275	36,618	31,663	33,098	32,840	499,535	57
	32,735	31,360	32,664	28,260	85,050	172,861	130,166	92,231	60,584	49,470	44,525	39,602	799,306	91
	41,045	31,704	38,243	47,349	152,119	149,140	120,741	138,091	57,117	54,989	49,822	49,663	930,519	106
	25,987	40,708	41,864	59,047	96,200	105,695	76,224	64,690	39,928	42,282	35,963	38,301	684,269	79
	35,358	34,335	39,064	44,114	87,437	208,531	125,306	93,923	111,480	56,544	55,110	48,127	959,199	107
	42,490	37,942	55,001	60,846	102,105	96,488	70,278	64,464	32,953	31,992	35,771	31,059	660,992	75
	32,797	35,289	38,314	32,987	62,052	74,085	60,010	46,273	45,491	40,283	34,367	31,775	523,629	59
	35,438	37,217	36,772	47,385	181,335	221,347	152,282	126,240	66,801	88,260	64,401	46,176	1,105,654	125
Ave	34915	34953	40446	43894	99100	131496	93879	79569	56210	46969	43380	39057	763878	84
						LA JUNTA TO CADDOA SECTION								
30	288	437	1,602	2,814	4,294	5,455	5,264	4,302	3,599	3,175	2,110	952	34,520	100
	0	799	2,106	4,100	4,870	4,830	3,990	1,998	1,787	1,651	1,682	0	27,813	80
	0	1,447	1,815	2,825	3,910	6,240	6,250	5,130	2,430	3,526	3,548	476	36,617	107
	99	627	2,060	1,973	4,140	8,060	4,770	5,150	3,696	2,561	2,884	1,960	37,980	111
	960	2,310	2,730	2,650	4,280	2,670	1,725	2,207	2,019	1,117	968	1,790	25,586	75
	1,260	827	1,998	1,137	3,363	4,840	5,400	4,130	3,218	2,196	2,741	962	32,387	94
	10	63	1,178	2,220	4,960	4,470	4,930	4,730	3,710	2,860	2,850	1,759	33,720	98
	708	1,750	2,436	3,030	4,690	5,580	5,930	3,410	3,580	4,200	1,387	0	36,551	106
	120	0	1,140	3,520	5,540	5,250	3,320	2,940	1,550	1,220	980	830	26,210	76
	0	100	1,970	1,602	3,230	3,870	2,770	1,945	2,998	1,420	1,620	690	22,207	65
	10	690	2,260	2,470	4,790	5,810	4,900	4,820	2,510	1,830	2,540	1,110	33,740	98
Ave	300	836	2060	2604	4513	4889	4359	3634	2818	2217	2111	948	31289	91
						CADDOA TO STATELINE SECTION								
30	1,338	2,941	7,568	12,588	18,946	28,390	28,520	18,782	12,998	11,164	11,722	3,975	161,731	100
	0	2,892	6,516	10,350	28,319	22,001	6,957	5,289	4,903	5,651	5,414	3,978	102,299	63
	7,165	5,268	7,281	6,691	14,013	29,604	25,635	24,010	6,662	7,018	9,366	3,165	139,893	86
	2,967	2,407	5,821	7,205	27,541	40,065	30,790	25,863	17,003	8,665	8,468	12,902	189,677	117
	8,904	8,027	9,279	7,146	16,539	8,501	8,506	3,689	11,930	4,833	3,798	4,478	95,500	59
	4,466	4,064	4,535	3,881	22,347	41,118	33,378	18,283	19,433	11,357	13,169	7,325	183,522	113
	3,678	1,162	3,694	4,510	31,753	16,412	22,984	36,262	15,009	25,370	15,091	9,025	182,730	113
	3,739	4,374	7,519	9,682	20,505	33,773	15,834	6,087	23,062	5,208	5,769	8,899	144,461	89
	8,898	8,362	9,663	7,115	27,320	31,954	31,967	15,484	27,890	17,080	13,461	10,664	206,098	127
	11,671	7,930	12,149	10,921	27,326	23,515	7,783	12,807	2,293	3,245	3,544	3,168	126,332	78
	2,459	5,393	8,345	7,116	13,066	16,451	3,406	7,499	11,509	6,310	6,373	9,223	100,150	62
	9,891	7,370	10,274	13,218	27,279	25,964	29,308	28,593	13,618	12,955	19,664	15,117	213,281	132
Ave	5254	5201	7378	7983	23273	26305	19686	16708	14210	9608	9663	7993	153063	95

COLORADO WATER CONSERVATION BOARD - Engineering Department

MONTHLY AND ANNUAL DIVERSIONS IN ACRE-FEET
FROM ARKANSAS RIVER IN KANSAS

Source of Data: U.S.G.S. Water Supply Papers and Reports of Kansas State Board of Agriculture, Division of Water Resources, 1931-39 incl.
Handwritten figures are calculated values.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL	PERCENT OF 1930 AVGE.
STATELINE TO GARDEN CITY SECTION*														
Avge. to 1930(a)	(5 full years of record plus 11 partial years) 6183	7994	7369	4607	6485	6760	7945	13824	6710	4476	6189	3074	81616	100
1931			13823	7089	6922	5431	394	157	0	149	14	2640		
1932	4028	6104	5030	1842	1406	15630	2565	2696	0	14	573	690	40578	50
1933	4385	5666	2253	930	13237	7686	5516	22241	23082	0	2764	5666	93426	114
1934	6465	6126	6003	1846	1961	2485	2577	26	6251	0	14	537	34291	42
1935	1638	1150	758	0	12373	22065	22938	7176	11184	2833	1450	4022	87587	107
1936	4920	5963	5092	466	18573	15328	5082	26194	3438	2991	4156	6611	98814	121
1937	1180	2024	4839	1964	506	23545	1180	132	18056	143	63	938	54570	67
1938	4174	3366	2669	4712	13008	30340	23982	5902	34770	4747	5680	6672	140022	172
1939	11411	6018	10546	8046	4497	967	2	0	0					
3/39 Avge.	4775	4127	5667	2988	8054	13419	7138	7169	10753	1358	1839	3473	70960 (b)	87

* Does not include three small ditches in vicinity of Syracuse.

(a) Monthly averages calculated from combination of some complete and some fractional records published in: -
Water Bailiff's Reports - 1915 to 1925
Surface Waters of Kansas - 1921 to 1924
Reports of Irrigation Commissioner - 1921 to 1926
Reports of Division of Water Resources, Kansas State Board of Agriculture - 1924 to 1930

(b) Sum of monthly averages.

Colo. Ex. 124 (Sheet 1 of

COLORADO WATER CONSERVATION BOARD - Engineering Department

MONTHLY AND ANNUAL TRANSMOUNTAIN DIVERSIONS IN ACRE FEET
FROM COLORADO AND GUNNISON RIVER BASINS INTO ARKANSAS RIVER BASIN

Source of Data: Official Records of Colorado State Engineer, 1931-1940 inclusive.
Handwritten figures are calculated values.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL
BUSK-IVANHOE TUNNEL - From Colorado River Basin to Arkansas River Basin.													
Avge. to 1930	(6-Year Record for years prior to 1931. Average calculated from values in Xan. Exhibit 21) 0	0	58	213	675	2249	678	368	197	252	42	0	4726
1931					344	1952	345	94	87	101			2923
1932				146	1153	2956	1373	311	115	52			6109
1933				432	716	3076	708	114	140	10			5196
1934				266	2183	864	79	44	19	28			3503
1935				285	416	2162	1390	290	203	166			5212
1936				634	2066	2885	824	405	181	213	38		7246
1937				370	1718	2161	573	165	168	8	106		5269
1938				259	695	2570	1608	202	130	63	30		5557
1939				597	1626	2504	384	87	0	85	27		5510
1940				9	1008	2395	391	93	53				3907
3-Ave Avge	0	0	0	331	1192	2378	768	181	178	73	20	0	5053
BOONE DITCH - From Colorado River Basin to Arkansas River Basin.													
Avge. to 1930	(14-Year Record for years prior to 1931. Average calculated from values in Xan. Exhibit 21) 54	50	55	62	345	594	220	118	78	76	66	58	1776
1931					63	116	80	42	28	31			390
1932					168	398	132	99	28	33			818
1933						322	121	44	31	28	7		553
1934					131	120	23						274
1935							127	33	16	10			186
1936					349	187							536
1937						176	122	52	26	6			382
1938					270	818	213	66	35	10			1412
1939					531	325	53	13					922
1940					80	78	14						172
3-Ave Avge	0	0	0	0	159	257	89	31	26	12	4	0	565
FREMONT PASS DITCH - From Colorado River Basin to Arkansas River Basin.													
Avge. to 1930	(2-Year Record for years prior to 1931. Average calculated from values in Xan. Exhibit 21) 0	0	0	0	8	286	396	308	168	15	0	0	1181
1931					213	497	201	108					1019
1932					163	1279	525	157	30				2154
1933					133	1224	398	40	80				1875
1934					757	579	290	133	10				1769
1935					33	956	506	121	10				1626
1936				6	183	810	320	296					1915
1937					298	545	270						1113
1938					91	934	509	51	82				1667
1939					355	686	47						1088
1940					116	379	112						634
3-Ave Avge	0	0	0	1	297	789	314	91	21	0	0	0	1512
COLUMBINE DITCH - From Colorado River Basin to Arkansas River Basin.													
Avge. to 1930	No diversions prior to 1931												
1931						219	42	15					276
1932					242	724	252	60	16				1314
1933					88	947	167	29					1231
1934					948	213	5	4	1				1171
1935					16	1003	210	26	4				1259
1936					783	747	152	95	24				1801
1937					646	501	137						1284
1938					99	1323	327	58					1797
1939					497	689	80	8					1274
1940					398	660	50						1108
3-Ave Avge	0	0	0	0	373	703	142	30	4	0	0	0	1252

COLORADO WATER CONSERVATION BOARD - Engineering Department

MONTHLY AND ANNUAL TRANSMOUNTA'N DIVERSIONS IN ACRE FEET
FROM COLORADO AND GUNNISON RIVER BASINS INTO ARKANSAS RIVER BASIN

Source of Data: Official Records of Colorado State Engineer, 1931-1941 inclusive.
Handwritten figures are calculated values.

YEAR	JAN.	FEB.	MAR.	APR.	MAY.	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL
WURTZ DITCH - From Colorado River Basin to Arkansas River Basin													
Avge. to 1930	No diversions prior to 1932												
1932					313	405							718
1933					286	1216	153	8					1669
1934				133	1025	202	23						1383
1935					264	2092	442	88	38	2			2926
1936				30	2084	1345	263	99					3761
1937					1075	576	89						1740
1938					817	1525	242	23					2607
1939					861	509	21						1471
1940					477	467	50						994
35 Ac Avge	0	0	0	13	800	935	140	34	4	0	0	0	1931
INDEPENDENCE PASS (TWIN LAKES) TUNNEL - From Colo. River Basin to Ark. River Basin													
Avge. to 1930	No diversions prior to 1935												
1935					713	11138	4148	1161	961	511	163	149	18834
1936	290	153	125	1066	5308	7845	2813	1816	0	0	0	0	19416
1937	48	141	141	213	11990	12520	5101	1340	626	236	260	194	32810
1938	155	122	130	366	5060	23700	10340	2470	2450	679	361	518	46351
1939	391	522	0	46	15100	14900	3710	559	274	290	130	29	36351
1940	32	41	51	451	6960	13510	2380	90	1080				24595
35 Ac Avge	53	63	70	357	8518	13936	4749	1206	882	286	152	148	30624
LAKESIDE (MARSHALL PASS) DITCH - From Gunnison River Basin to Ark. River Basin													
Avge. to 1930	No diversions prior to 1935												
1935						42	9						51
1936				9	218	178	36	40	4	0			485
1937					110	5							115
1938					89	160	9						258
1939					99	60	6						165
1940					12								12
35 Ac Avge	0	0	0	1	93	74	7	7	1	0	0	0	183

SUMMARY

TRANSMOUNTAIN DIVERSIONS INTO ARKANSAS RIVER BASIN

Avge. to 1930	54	50	313	275	1028	3529	1254	788	443	343	108	58	7681
1931					620	2814	668	259	115	132			11608
1932				140	2359	5762	2202	560	189	86			11707
1933				432	1223	6785	1537	235	251	38	7		10508
1934				419	5044	1978	428	181	30	20			8100
1935				265	1142	17693	6825	1719	1132	689	163	149	30746
1936	290	153	125	1745	15321	13997	4308	2751	209	213	48		39419
1937	48	141	141	583	15837	16484	6242	1357	820	250	366	194	42918
1938	155	122	130	621	7091	31030	13248	2870	2697	752	391	518	60878
1939	391	522	0	643	19069	19753	4301	667	274	375	157	29	46381
1940	32	41	51	460	11078	17469	2997	181	1133	0	0	0	33351
35 Ac Avge	92	93	45	563	7968	13375	4392	1081	685	356	112	89	28954

Table of Contents

STORAGE DATA

AVERAGE STORAGE ON FIRST OF MONTH IN ACRE FEET

IN PRINCIPAL RESERVOIRS OF ARKANSAS RIVER BASIN - COLORADO

for years of record prior to 1931
from Kansas Exhibit No. 66

STORAGE ON FIRST OF MONTH IN ACRE FEET

IN PRINCIPAL RESERVOIRS OF ARKANSAS RIVER BASIN - COLORADO

FOR YEARS 1931-1940 INCLUSIVE

from

Official Records of Colorado State Engineer

CALCULATED AVERAGE STORAGE ON FIRST OF MONTH IN ACRE FEET

IN PRINCIPAL RESERVOIRS OF ARKANSAS RIVER BASIN - COLORADO

FOR THE PERIOD OF YEARS FOLLOWING 1930

Reservoirs Include:

Reservoir	Page
Sugar Loaf Reservoir	2
Twin Lakes Reservoir	2
Clear Creek Reservoir	2
DeWoese-Dye Reservoir	2
City of Colorado Springs	3
Fountain Valley Res. No. 2	3
Cucharas Reservoir	3
Lake Henry	3
Lake Meredith	4
Dye Reservoir	4
Holbrook No. 1 Reservoir	4
Horse Creek Reservoir	4
Adobe Creek Reservoir	5
Great Plains Reservoirs	5
Model Reservoir	5
Two Buttes Reservoir	5

COLORADO WATER CONSERVATION BOARD - Engineering Department

STORAGE ON FIRST OF MONTH IN ACRE FEET
IN PRINCIPAL RESERVOIRS OF ARKANSAS RIVER BASIN - COLORADO

Source of Data: Official Records of Colorado State Engineer, 1931-1940 inclusive. Handwritten figures are calculated values.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVER. STOR.
SUGAR LOAF RESERVOIR													
Avge. to 1930	8406	8483	8955	8584	7193	8321	10090	9368	7995	8091	7838	8228	
1931	7810	8104	8103	8013	6067	2965	3805	2008	1508	1267	1308	1308	
1932	1688	1621	1621	1621	1868	280	5772	3339	2693	2286	2565	-	
1933	-	-	-	-	-	-	-	-	-	-	-	5586	
1934	5586	5586	5639	5638	5140	6306	6324	4311	4150	4067	4025	3996	
1935	3996	3996	3996	3996	4204	5876	11877	13272	7286	7163	7668	7696	
1936	7696	7696	7696	7476	6922	14197	13262	12947	8139	7655	7872	7909	
1937	7909	7909	7909	7909	5106	4363	7261	6120	2562	2493	2493	2599	
1938	-	-	-	-	-	-	-	-	-	-	-	-	
1939	5872	6219	6453	6597	6939	8139	3266	4714	1512	1512	1587	1508	
1940	1508	1692	1692	1692	1692	4046	7253	6944	3350	3075	3135	-	
5 Av.													
Avge	5239	5353	5389	5368	4691	5773	8403	6454	3842	3727	3828	4371	
TWIN LAKES RESERVOIR													
Avge. to 1930	18976	19788	20831	18019	16063	17806	22601	21103	17943	19398	16978	17308	
1931	13523	14224	13453	13403	13453	9397	9214	6519	5723	5491	5756	5308	
1932	5490	6470	6470	6470	5856	18687	16885	9920	7056	5823	5707	-	
1933	-	-	-	-	-	-	-	-	-	-	-	7391	
1934	6721	6389	6171	5690	6553	10260	7307	7056	7056	5839	5474	5374	
1935	5374	5374	5374	5374	5374	7894	38161	26572	10363	10977	13425	13435	
1936	13857	14096	14300	14121	13523	33450	43552	28381	13361	15118	16778	17368	
1937	17178	17500	17651	17310	11614	18184	16712	10998	8125	8996	8557	7930	
1938	-	-	-	-	-	-	-	-	-	-	-	-	
1939	27365	27847	28331	28131	23801	-	44085	33465	17521	17072	16961	15771	
1940	15805	15502	15591	15092	15991	20919	23196	17567	9975	10683	10965	-	
5 Av.													
Avge	13164	13423	13418	13178	12744	15870	24943	16735	9891	10000	10453	10369	
CLEAR CREEK RESERVOIR													
Avge. to 1930	4940	5055	5184	5618	4943	6915	7645	5149	4678	4678	5959	4251	
1931	2629	2835	2795	2793	2795	2517	1502	920	0	34	262	262	
1932	770	1025	1025	1025	1113	1344	6238	2675	1552	1552	1605	-	
1933	-	-	-	-	-	-	-	-	-	-	-	2138	
1934	2138	2265	2138	2264	2264	792	210	169	169	1133	160	161	
1935	161	161	161	161	161	727	9851	7622	1752	2140	858	858	
1938	0	0	0	0	205	10774	9770	5832	7376	3950	1868	870	
1937	167	167	167	167	0	2651	3992	2291	0	0	0	0	
1938	-	-	-	-	-	-	-	-	-	-	-	-	
1939	4049	4460	4649	5095	3499	-	688	487	502	502	538	776	
1940	776	1006	1006	1006	1006	1084	931	693	135	337	776	-	
5 Av.													
Avge	1349	1528	1531	1602	1338	2770	4076	2561	1436	1206	752	924	
TURQUOISE-DIX RESERVOIR													
Avge. to 1930	2223	2663	2780	2780	2666	2214	1918	2039	1974	1927	1647	1944	
1931	1955	2768	2768	2768	2768	2676	2365	1315	165	0	0	0	
1932	1509	2003	1523	2967	2858	1918	2145	1433	1052	506	358	420	
1933	957	1203	1251	1251	1251	3832	4260	2982	2780	2197	968	916	
1934	916	968	968	968	892	506	91	201	65	0	0	0	
1935	0	0	165	0	10	777	4326	3837	3862	3723	3738	3723	
1936	4326	4326	4326	4218	3568	3812	3297	2721	1200	3198	3693	3222	
1937	3222	3712	4222	4222	3820	3712	2896	1818	957	1257	1109	935	
1938	-	-	-	-	-	-	-	-	-	-	-	-	
1939	2661	2762	3081	3520	3297	2661	1998	750	379	0	0	0	
1940	0	576	576	591	555	698	500	277	251	220	401	-	
5 Av.													
Avge	1727	2033	2096	2279	2124	2287	2386	1704	1523	1231	1139	1150	

* Average of calculated monthly averages.

COLORADO WATER CONSERVATION BOARD - Engineering Department

STORAGE ON FIRST OF MONTH IN ACRE FEET
IN PRINCIPAL RESERVOIRS OF ARKANSAS RIVER BASIN - COLORADO

Source of Data: Official Records of Colorado State Engineer, 1931-1960 inclusive.
Handwritten figures are calculated values.

Year	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVERAGE STORAGE
CITY OF COLORADO SPRINGS RESERVOIRS													
Rec.	(5-year Record of years prior to 1931. Averages calculated from values in Exhibit 66)												
1930	4123	3988	3689	3311	3302	4114	4766	5014	5192	5075	4514	4274	4286
31	4666	4512	4114	3574	3267	3909	5103	5175	4540	3701	3456	2512	4047
32	2374	2534	2110	1809	1596	1715	1486	1694	1892	1789	993	-	1803
33	-	-	-	-	-	-	-	-	-	-	-	4260	-
34	4016	3964	3684	3437	3500	4195	3609	2761	2074	1127	952	619	2856
35	395	332	285	395	395	881	3064	289	4858	5084	4637	5335	3179
36	4165	4192	3151	2969	2370	3798	3628	2973	1200	5130	4970	4997	3537
37	4657	4292	3243	2756	2791	3126	2878	2634	2298	1766	1826	1533	2812
38	-	-	-	-	-	-	-	-	-	-	-	-	
39	-	4318	3903	-	3219	-	-	-	4185	4185	-	1823	
40	1823	-	1786	997	615	1430	-	1572	-	-	1785	-	
Ave	3156	3348	2866	2270	2224	2722	3295	2443	3665	3332	2660	2759	2851 *
FOUNTAIN VALLEY RESERVOIR NO. 2													
Rec.	(5-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66)												
1930	1840	3212	1207	1676	1708	1231	3372	2072	1395	1312	1188	1122	2771
31	3128	1898	1898	1898	1898	1898	3214	1496	240	151	151	151	2778
32	1622	2571	3128	3128	3214	2785	2076	1180	1180	810	708	-	2080
33	1372	2240	3214	3214	3405	1665	4114	2785	2571	2076	1910	1496	2756
34	2571	3894	1665	1987	1898	3644	2140	1094	708	932	532	532	2532
35	606	708	1496	1718	1665	3214	2571	1622	810	912	1116	1116	1680
36	1370	2571	3128	3128	3128	3000	2240	1116	1622	1622	3000	2571	2450
37	3000	3894	1898	1898	5076	3894	3128	1622	532	912	912	991	2788
38	1214	2240	1718	1910	2394	2785	2785	2940	1622	3405	3405	3405	2415
39	4520	5061	5061	5076	5076	4114	2785	1718	912	532	532	550	3000
40	564	708	963	1011	1011	1496	1291	912	151	391	532	-	815
Ave	2030	2879	3378	3440	3565	3451	2487	1575	1036	1136	1280	1277	2308 *
CUCHARAS RESERVOIR													
Rec.	(5-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66)												
1930	16562	16403	16518	16954	15260	19791	19091	17715	18925	17659	16391	16172	16581
31	12992	15380	11988	11988	15380	13490	9630	7080	4630	0	0	0	8636
32	0	0	1880	1880	1880	1640	1760	1250	3080	1940	1940	1880	1864
33	1640	1640	1640	1640	1640	1160	9662	7300	6950	8010	8010	7868	5013
34	6850	6104	6080	6290	6290	1880	800	800	0	0	0	0	2878
35	-	-	-	-	-	1150	9576	1774	6090	9880	-	-	
36	-	1956	1956	1993	14336	6090	6600	21690	32214	35149	27140	27077	15703
37	26260	26240	26240	23932	29200	20510	16396	12120	4340	6370	4988	4402	16382
38	-	-	-	-	-	-	-	-	-	-	-	-	
39	1940	1816	1818	2661	2108	1160	1103	805	656	163	316	218	1282
40	314	419	419	419	419	562	522	522	322	322	322	7	5363
Ave	7087	6819	7254	7096	8667	5791	6096	6232	6391	6459	5337	5925	6605 *
LAKE HENRY RESERVOIR													
Rec.	(5-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66)												
1930	6370	6470	6711	6520	6660	6299	5046	4730	4567	2743	2362	3626	4922
31	3134	6173	6517	5753	5739	3961	3408	627	343	1100	922	0	3106
32	8217	6209	9912	5736	5312	1858	1787	1121	758	758	0	0	2639
33	-	-	-	-	-	-	-	-	-	-	-	1984	-
34	1780	1661	1849	1759	1633	1026	0	0	0	0	0	0	809
35	0	0	0	0	0	0	2865	3147	3727	2630	2096	1693	1363
36	1662	2701	5177	4850	3345	5139	4897	6019	4860	3510	3147	2705	4000
37	4617	5916	6011	5814	4617	3597	3597	2868	2343	2127	1662	1391	3713
38	-	-	-	-	-	-	-	-	-	-	-	-	
39	5223	5469	5617	5614	5130	5321	-	2630	2630	2630	1661	1128	3946
40	969	2630	5617	5469	4384	-	3858	4031	3166	2530	1849	-	3652
Ave	2650	3845	4588	4374	3770	2986	2916	2555	2230	1911	1362	1113	2842 *

* Average of calculated monthly averages.

COLORADO WATER CONSERVATION BOARD - Engineering Department

STORAGE ON FIRST OF MONTH IN ACRE FEET
IN PRINCIPAL RESERVOIRS OF ARKANSAS RIVER BASIN - COLORADO

Source of Data: Official Records of Colorado State Engineer, 1911-1940 inclusive.
Handwritten figures are calculated values.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVG. STOR.
LAKE MEREDITH RESERVOIR													
Avge. to 1930	(5-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66) 13058	20760	21981	21660	20120	17538	15116	7210	6491	5931	5109	7336	
1931	5680	20573	26288	26833	25897	18453	12862	8892	2110	0	0	0	
1932	0	2617	4991	3573	2698	0	0	0	0	0	0	0	
1933	0	0	0	0	0	0	0	0	0	0	0	0	
1934	0	0	0	0	0	0	0	0	0	0	0	0	
1935	0	0	0	0	0	0	0	0	0	0	0	0	
1936	0	0	0	0	0	0	0	0	0	0	0	0	
1937	0	0	1274	0	0	0	0	0	0	0	0	0	
1938	-	-	-	-	-	-	-	-	-	-	-	-	
1939	922	3643	11513	21761	22095	16959	2922	500	0	0	0	0	
1940	0	0	0	-	0	0	0	0	0	0	-		
5-Yr Avge													
Avge	734	3981	4852	6896	5832	3935	1754	1044	238	0	0	0	
DYE RESERVOIR													
Avge. to 1930	(5-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66) 2143	2652	2689	2398	2135	1740	2094	1475	2243	1825	1012	1364	
1931	4570	4825	4821	4782	4659	3867	2452	1953	1798	1346	0	0	
1932	951	2118	2009	1939	1851	0	817	1371	0	0	0	0	
1933	-	-	-	-	2370	1438	1531	1501	2066	1911	2370	2743	
1934	2516	2683	2220	1688	1630	0	0	0	0	0	0	0	
1935	0	0	0	0	0	2326	3761	2174	864	1296	1266	776	
1936	841	2141	4139	3156	1560	3331	1885	2362	2081	2031	1126	1121	
1937	1218	1518	2683	2618	1189	262	0	0	0	321	86	110	
1938	-	-	-	-	-	-	-	-	-	-	-	-	
1939	2762	2901	3165	3165	2828	1087	576	0	0	0	0	0	
1940	0	0	136	110	0	211	0	0	0	0	0	-	
5-Yr Avge													
Avge	1590	2070	2386	2186	1743	1247	1225	1040	756	771	572	632	
HOLBROOK NO. 1 RESERVOIR													
Avge. to 1930	(5-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66) 4093	4747	4901	4679	4263	3509	2659	1999	2387	2174	1793	2405	
1931	3447	4305	4317	4214	4069	3972	2173	1660	1419	1152	0	1	
1932	3643	4342	4342	4088	3905	657	526	350	0	0	0		
1933	0	0	3600	3233	4139	4956	2835	1956	2199	1795	408	0	
1934	0	408	3280	1315	1207	202	0	0	0	0	0	0	
1935	0	0	0	0	0	368	1492	1823	1722	532	981	450	
1936	1601	4293	4495	4492	5035	5290	501	3351	2698	2284	1551	1561	
1937	2918	3670	3792	3670	3615	1562	855	664	602	695	217	209	
1938	-	-	-	-	-	-	-	-	-	-	-	-	
1939	4005	4315	4312	4312	4200	2146	980	240	58	0	0	0	
1940	0	1324	3324	2885	2716	1621	552	205	0	0	0		
5-Yr Avge													
Avge	1738	2532	3296	3158	2985	2364	1903	1472	940	745	307	265	
HORSE CREEK RESERVOIR													
Avge. to 1930	(5-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66) 6971	10206	11168	11214	9165	7961	9003	8735	12794	9829	6847	7178	
1931	14153	15512	16108	14909	12833	9200	3865	0	0	0	0	0	
1932	0	0	0	0	0	0	495	0	0	0	0	0	
1933	0	0	0	264	4312	7912	11444	1826	1922	0	0	0	
1934	0	0	0	0	0	0	0	0	0	0	0	0	
1935	0	0	0	0	0	3210	8529	7063	0	686	0	0	
1936	0	0	3467	2750	0	6306	13450	13269	17144	8852	8260	7941	
1937	8086	8086	8144	7633	7294	5777	2781	0	426	578	0	0	
1938	-	-	-	-	-	-	-	-	-	-	-	-	
1939	2866	4022	5704	8874	8250	7035	4220	0	0	0	0	0	
1940	0	0	0	0	0	0	0	0	0	0	0	-	
5-Yr Avge													
Avge	2789	3469	3776	3937	3633	4330	3965	2662	2466	1124	907	882	

* Average of calculated monthly averages.

COLORADO WATER CONSERVATION BOARD - Engineering Department

STORAGE ON FIRST OF MONTH IN ACRE FEET
IN PRINCIPAL RESERVOIRS OF ARKANSAS RIVER BASIN - COLORADO

Source of Data: Official Records of Colorado State Engineer, 1931-1940 inclusive.
Handwritten figures are calculated values.

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVERAGE STORAGE
ADOBE CREEK RESERVOIR													
(9-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66)													
1930	19419	23040	26036	26355	21894	20628	28207	23860	25256	25143	18375	18855	22989
1931	31961	37075	39193	39193	46335	28224	23306	0	0	0	0	0	20661
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	-	-	-	-	-	-	-	-	-	-	-	0	-
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	5184	5190	1187	0	0	0	0	652
6	0	0	0	0	0	0	0	3110	4143	2693	2200	2009	1180
7	2009	2009	1185	1797	1185	0	2693	0	0	913	0	0	1033
8	-	-	-	-	-	-	-	-	-	-	-	-	-
9	8495	8596	8415	8432	8166	1666	961	0	0	0	0	0	3936
1940	0	0	0	0	0	0	0	0	0	0	0	-	0
Ave*	5321	5960	6137	6178	6998	4509	3764	575	518	451	275	251	3417*
GREAT PLAINS RESERVOIRS													
(9-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66)													
1930	41867	47142	52095	51894	50256	50323	50938	55271	44909	43611	41251	42796	47556
1931	80902	81571	81983	70954	69317	67225	60118	6574	7137	9879	6923	6134	40528
2	6172	6172	3987	2725	2704	2530	2006	1657	817	1890	0	0	2605
3	-	-	-	-	-	-	-	-	-	-	-	0	-
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	777	65
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	-	-	-	-	-	-	-	-	-	-	-	-	-
9	6111	6386	6113	6556	6059	5459	4627	3974	3290	2785	2551	1987	4667
1940	1901	1815	1987	2199	1815	1566	0	0	0	0	0	-	1031
Ave*	9427	9493	9496	10312	9989	9596	8344	7526	6406	6466	5957	5112	6078*
MODEL RESERVOIR													
(9-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66)													
1930	7293	7761	8401	8687	9040	9736	7881	7698	9124	6902	6822	7318	8055
1931	12789	13307	13517	11603	11385	15141	11775	7390	5105	3757	4364	4430	10030
2	5522	6684	6684	6684	6352	5339	5393	3384	0	60	727	-	4255
3	-	-	-	-	-	-	-	-	-	-	-	2736	-
4	3136	3136	3400	3069	2736	0	0	0	0	0	0	0	1290
5	0	0	0	0	0	3378	1386	2819	6601	3702	3752	622	1338
6	5326	4127	3927	3203	2622	4869	2086	1754	1336	547	1754	1629	2593
7	2771	2771	2771	2418	1754	0	5225	0	547	3349	2672	2672	2246
8	-	-	-	-	-	-	-	-	-	-	-	-	-
9	8229	8767	9192	8974	8456	6016	2114	0	0	0	0	0	4315
1940	0	468	1207	1273	1307	834	0	0	75	1902	1606	-	707
Ave*	4472	4908	5087	5028	4702	4447	3501	1893	958	1575	1469	1727	3342*
TWO BUTTES RESERVOIR													
(9-year Record of years prior to 1931. Averages calculated from values in Kan. Exhibit 66)													
1930	16619	14139	14358	13804	13607	12087	11612	11733	10892	9350	14336	9181	12686
1931	5364	5364	5456	5828	5457	1963	2166	1761	2303	137	2160	2193	3344
2	2610	1963	2987	3260	3260	3123	7615	1622	3205	2987	3994	-	3596
3	-	-	-	-	-	-	-	-	-	-	-	10174	-
4	7815	7315	7125	7365	7163	9876	4224	1405	1405	1405	3606	3508	5628
5	3425	3370	3315	3260	3041	5828	8018	3172	7113	11952	11698	10555	6279
6	9175	9538	9666	9539	8788	29951	32741	32546	37650	34716	32741	33657	24253
7	32924	32190	31824	30926	28656	24109	21332	29929	22105	21499	23215	22771	24965
8	-	-	-	-	-	-	-	-	-	-	-	-	-
9	28961	28656	27523	27305	26869	24332	22660	22105	22105	18194	16779	15994	23454
1940	11772	11197	11320	11229	11157	12794	11762	8555	9820	9660	6305	-	11876
Ave*	13172	12879	12887	12776	12176	13697	14190	14137	13601	13335	12550	14146	13260*

* Average of calculated monthly averages.

Table of Contents

IRRIGATED ACREAGE DATA

AVERAGE IRRIGATED ACREAGE - ARKANSAS RIVER BASIN, COLORADO
SEGREGATION BY WATER DISTRICTS
for years of record prior to 1931, from
Official Records of Colorado State Engineer

IRRIGATED ACREAGE - ARKANSAS RIVER BASIN, COLORADO
SEGREGATION BY WATER DISTRICTS
FOR THE YEARS 1931-1940 INCLUSIVE
from
Official Records of Colorado State Engineer

CALCULATED AVERAGE IRRIGATED ACREAGE - ARKANSAS RIVER BASIN, COLORADO
SEGREGATION BY WATER DISTRICTS
FOR THE PERIOD OF YEARS FOLLOWING 1930
Included are: Page
Water Districts No. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 67 3

IRRIGATION OF AGRICULTURAL LANDS, ARKANSAS RIVER BASIN
COLORADO AND KANSAS
from
16th Census of the United States, Census of Irrigation - Colorado
and Census of Irrigation - Kansas

IRRIGATED FARMS - 1939; AREA IRRIGATED - 1939, 1929 AND 1919;
IRRIGABLE AREA IN ENTERPRISES - 1940, 1930 AND 1920; AREA WORKS WERE
CAPABLE OF SUPPLYING WITH WATER - 1940, 1930 AND 1920
from
Basin Table 1 and County Table 1;
Census of Irrigation - States of Colorado and Kansas

Items include: Page
Basin Totals as Reported 4
Totals for Basins above vicinity of Garden City, Kans. 4

Table of Contents (Cont'd)

IRRIGATED ACREAGE IN SCOTT COUNTY, KANSAS

from

U. S. Geological Survey, Water Supply Paper 886, 1940

and

16th Census of the United States, 1940
Irrigation of Agricultural Lands - Kansas

IRRIGATED ACREAGE IN THE SCOTT COUNTY SHALLOW-WATER BASIN, 1931-1939

AREA IRRIGATED - SCOTT COUNTY - 1919, 1929 AND 1939

Items include:

	Page
Irrigated acreage, 1931-1939 - U.S.G.S. Data	5
Area irrigated - 1919, 1929 and 1939 - 16th Census Data	5

COLORADO WATER CONSERVATION BOARD - Engineering Department

IRRIGATED ACREAGE - ARKANSAS RIVER BASIN, COLORADO
SEGREGATION BY WATER DISTRICTS
Values in Acres

Source of Data: Official Records of Colorado State Engineer.
Handwritten figures are calculated values.

	WATER DISTRICTS												PERCENT OF 1930 AVGE.
	10	11	12	13	14	15	16	17	18	19	67	TOTAL	
Avge. to 1930	15640	23801	22327	17816	112611	7581	33816	163846	5408	33769	59748	496363	100
1931	20487	22544	22152	21993	132101	8557	49004	164274	5981	27111	61173	535377	108
1932	12757	23417	20320	21936	119935	6271	37579	163572	5184	22362	66908	500241	101
1933	18751	25283	21320	22203	108069	7581	41482	163140	4432	20120	63992	496373	100
1934	11132	33465	17783	12868	53891	7358	35929	153628	4677	17234	68408	416373	84
1935	12357	25440	19385	22298	93197	7452	40349	154570	4009	24048	68754	469859	95
1936	12211	27412	18724	20135	106606	8527	41876	158409	3195	23059	73206	493360	99
1937	18121	33954	19139	22316	101127	7181	41361	153221	1625	28288	62253	488886	98
1938	11654	32142	20707	23018	103030	8196	42273	158416	1478	23555	62217	486686	98
1939	13038	30860	20479	17249	100578	8077	38263	152878	1415	21737	61098	465672	94
1940	12255	36500	18328	16347	88456	6900	35553	150817	2937	26219	60857	455169	92
31-41 Avge.	14276	29102	19834	20036	100529	7610	40367	157293	3493	23373	64887	480800	97

Page 69

Colo. Ex. 196 (Sheet 3 of 5)

COLORADO WATER CONSERVATION BOARD - Engineering Department

IRRIGATION OF AGRICULTURAL LANDS
ARKANSAS RIVER BASIN.
COLORADO AND KANSAS
FROM
16th CENSUS OF THE UNITED STATES: 1940

BASIN TABLE 1 Item No.	IRRIGATED FARMS IRRIGATED AND IRRIGABLE AREAS	BASIN TOTALS AS REPORTED COLO.	KAN.	COUNTY TABLE 1 Item No.	TOTALS FOR BASIN ABOVE VICINITY OF GARDEN CITY COLO. (1)	KAN. (2)
1	Irrigated Farms - 1939 - number	7,837	1,291	3	7,816	478
2	Area Irrigated - 1939 - acres	469,535	88,196	18	469,168	56,341
6	Area Irrigated - 1929 - acres	558,072	69,879	22	557,933	60,072
7	Area Irrigated - 1919 - acres	641,476	46,539	23	641,476	40,660
8	Increase or Decrease (-), 1929-1939 p'ct.	- 15.9	26.2	24	- 15.8	- 6.2
9	Irrigable area in enterprises - 1940 - acres	672,627	127,950	25	671,840	78,477
10	Irrigable area in enterprises - 1930 - acres	762,208	91,361	26	761,915	76,861
11	Irrigable area in enterprises - 1920 - acres	938,533	98,982	27	938,533	63,378
15	Area works were capable of supplying with water-1940-acres	622,846	124,700	30	622,369	78,065
16	Area works were capable of supplying with water-1930-acres	690,955	81,177	31	690,815	67,997
17	Area works were capable of supplying with water-1920-acres	709,068	64,457	32	709,068	54,288
18	Increase or decrease (-), 1930-1940 p'ct.	- 9.9	53.6	33	- 9.9	14.8

(1) Basin totals as reported minus totals reported for Cimarron Basin.

Colo. (Sheet

Source of Data: U. S. Geological Survey, Water Supply Paper 886, 1940 and
16th Census of the United States, 1940 - Irrigation of Agricultural Lands - Kansas

From U. S. G. .S. Water Supply Paper 886, page 185:

"The following table is based on records of the Division of Water Resources of the Kansas State Board of Agriculture and shows the increase in irrigated acreage during the last 9 years."

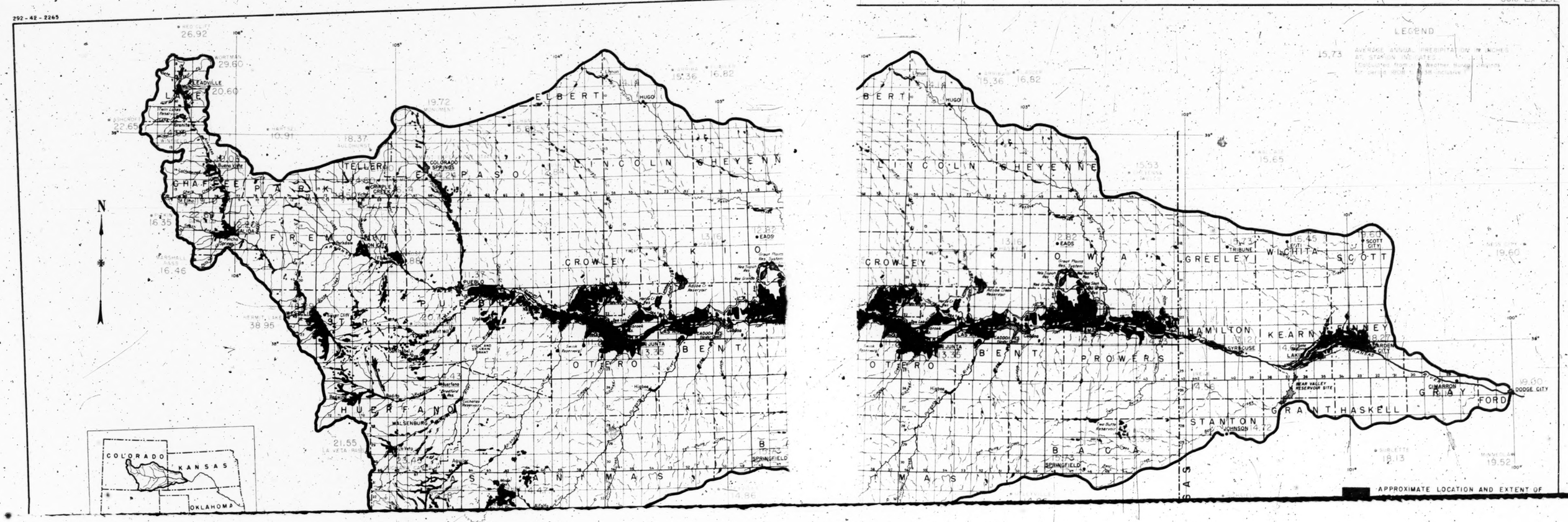
IRRIGATED ACREAGE IN THE SCOTT COUNTY SHALLOW-WATER BASIN, 1931-1939

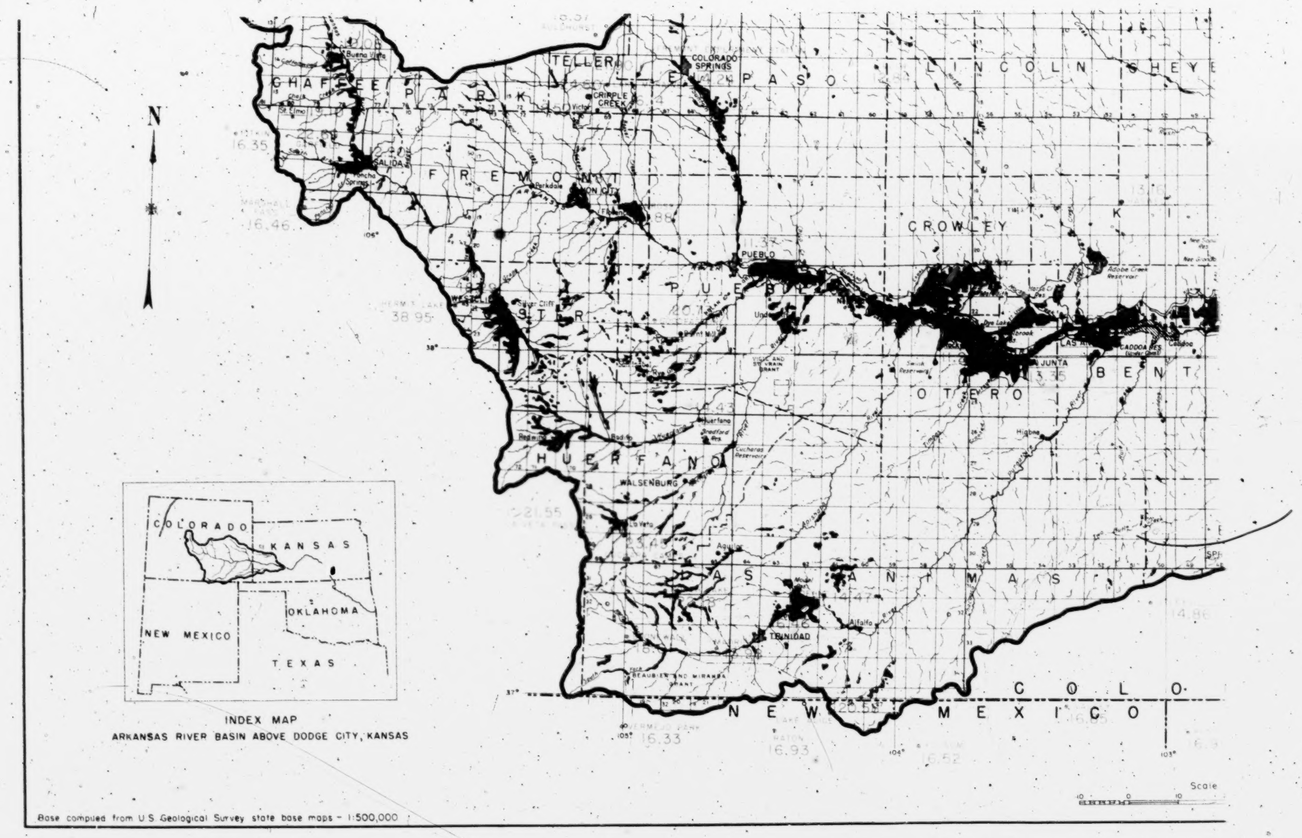
YEARS	1931	1932	1933	1934	1935	1936	1937	1938	1939
ACRES	2262	1021	2035	3859	4234	3849	6828	10355	12000

From Census of Irrigation - Kansas, County Table 1

Item No.	Item	Scott Co.
23	Area irrigated - 1919 - acres	3047
22	Area irrigated - 1929 - acres	3432
18	Area irrigated - 1939 - acres	13389

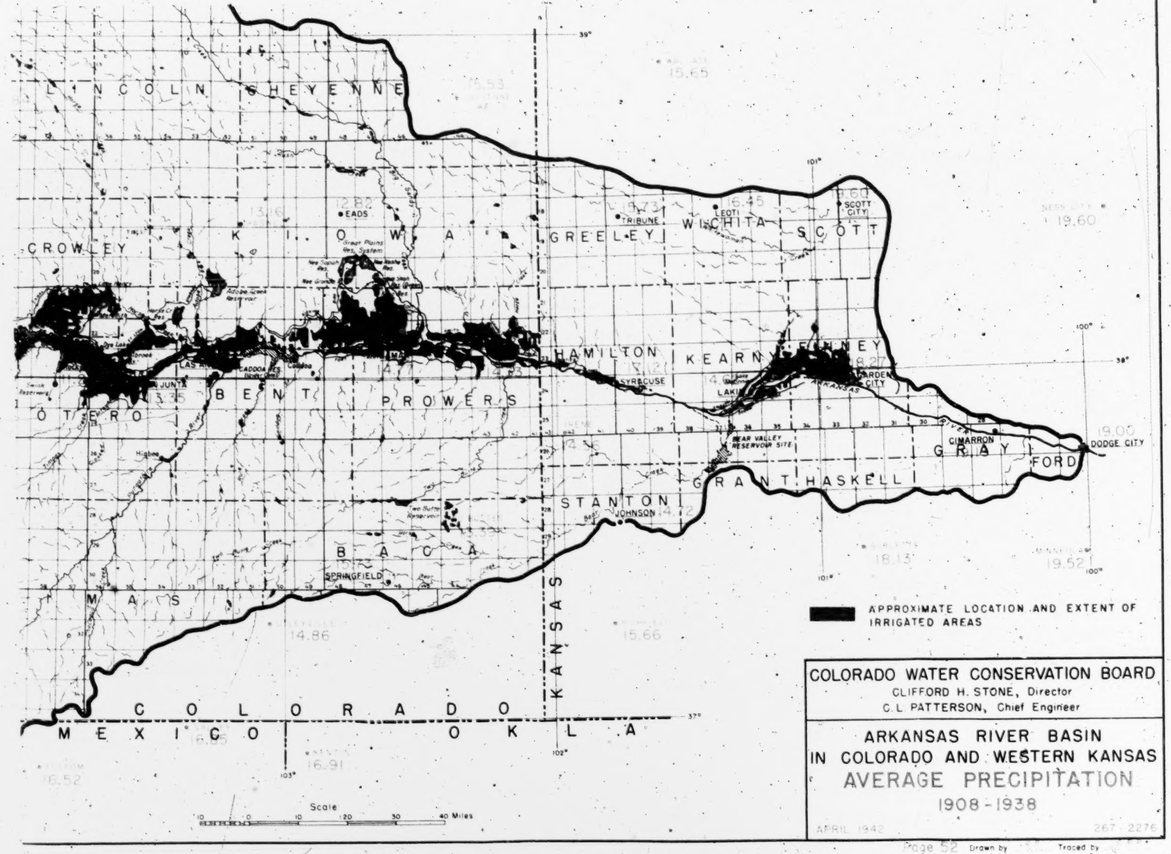
Colo. Ex. 196
(Sheet 5 of 5)


292-42-2265
LEGEND
AVERAGE ANNUAL PRECIPITATION IN INCHES AT STATION INDICATED
Calculated from the Weather Bureau records for period 1908 to 1938 inclusive
N
LAKE
CHAFFEE
PARK
FREMONT
TELLER
EL PASO
ELBERT
LINCOLN
CHEYENNE
CROWLEY
KIOWA
GREELEY
WICHITA
SCOTT
PUEBLO
OTERO
BENT
HUERFANO
LAS ANIMAS
HAMILTON
KEARNY
FINNEY
PROWERS
STANTON
GRANT
HASKELL
GRAY
FORD
BACA
LEADVILLE
COLORADO SPRINGS
CRIPPLE CREEK
PUEBLO
EADS
HUGO
JUNTA
WALSENBURG
SPRINGFIELD
TRIBUNE
SCOTT CITY
SYRACUSE
LAKE
GARDEN CITY
CIMARRON
DODGE CITY
JOHNSON
BEAR VALLEY RESERVOIR SITE
COLORADO
KANSAS
OKLAHOMA
APPROXIMATE LOCATION AND EXTENT OF



INDEX MAP
ARKANSAS RIVER BASIN ABOVE DODGE CITY, KANSAS

Base compiled from U.S. Geological Survey state base maps - 1:500,000



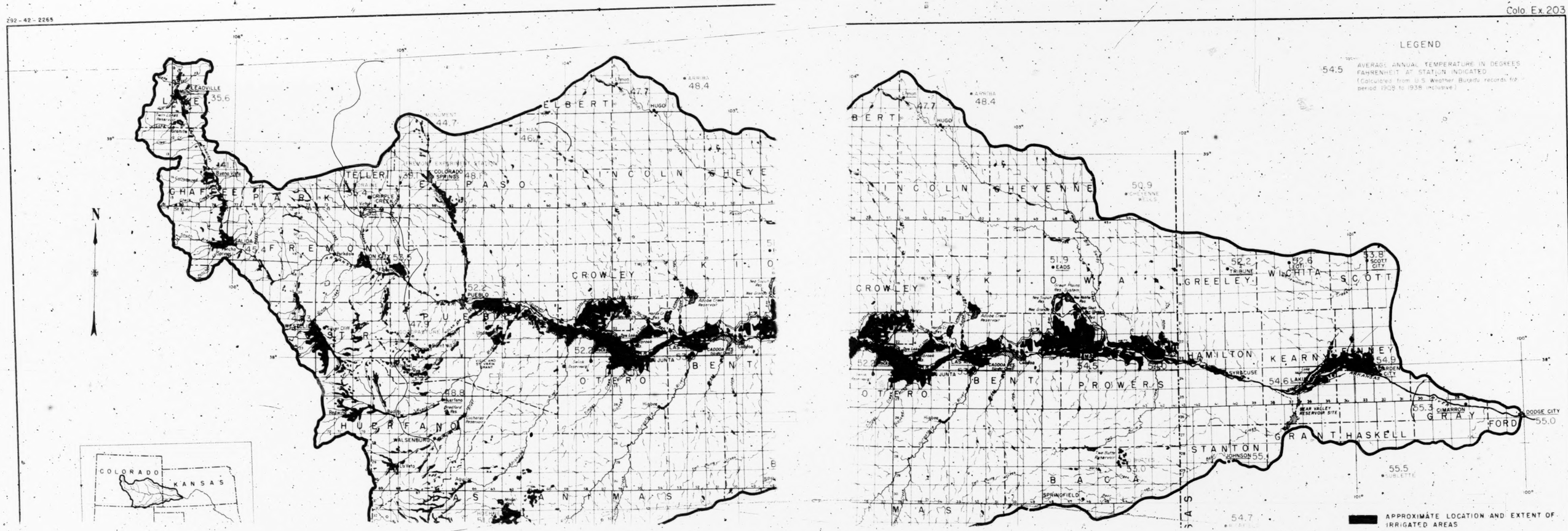
APPROXIMATE LOCATION AND EXTENT OF IRRIGATED AREAS

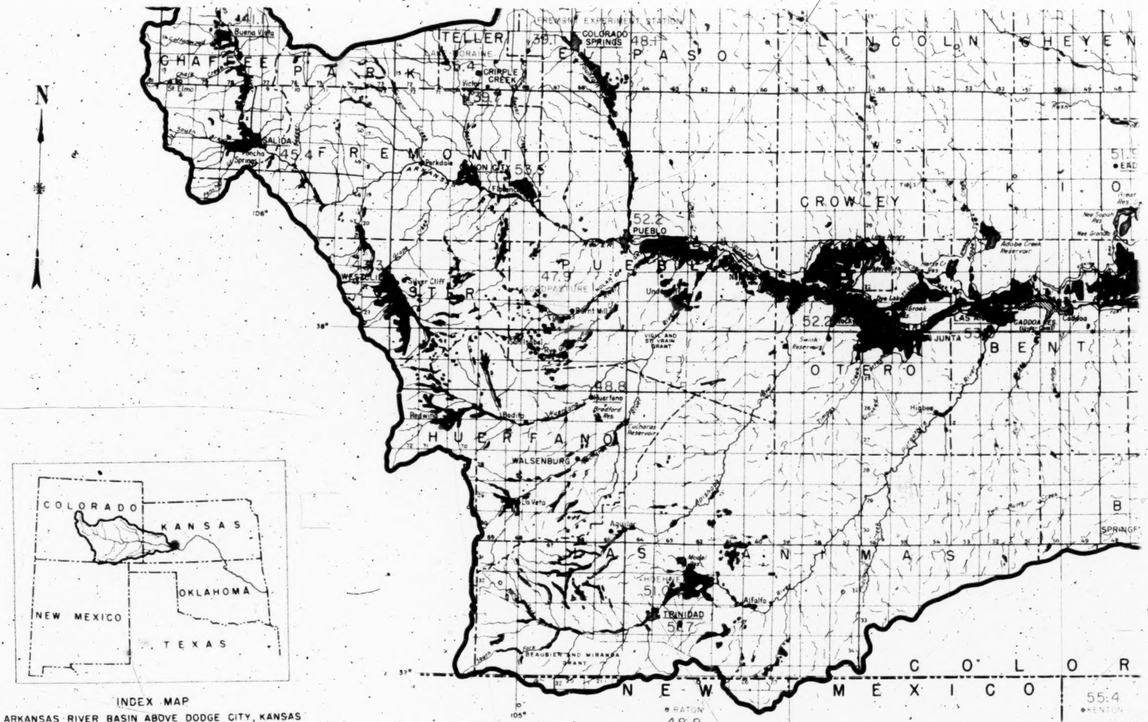
COLORADO WATER CONSERVATION BOARD
CLIFFORD H. STONE, Director
C.L. PATTERSON, Chief Engineer

ARKANSAS RIVER BASIN IN COLORADO AND WESTERN KANSAS AVERAGE PRECIPITATION 1908-1938

APRN. 1948 267.2276

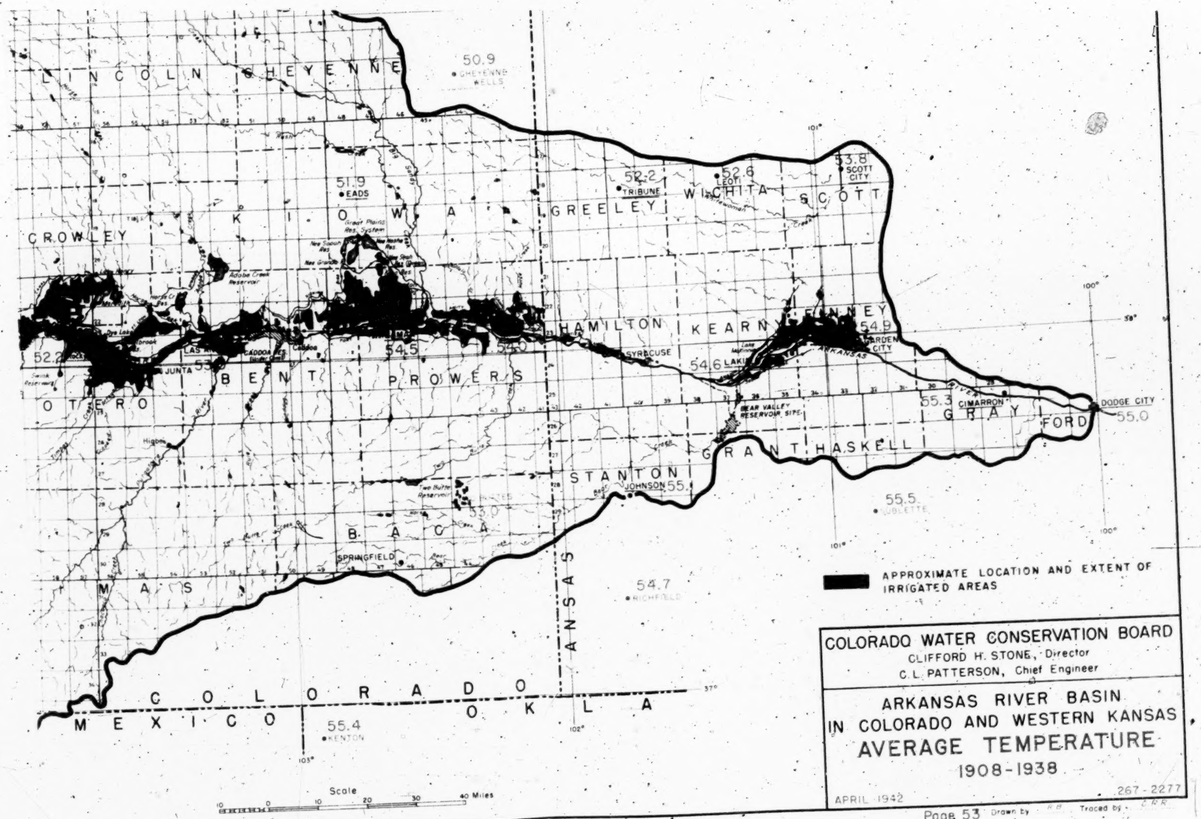
Page 52 Drawn by Traced by


LEGEND
54.5 AVERAGE ANNUAL TEMPERATURE IN DEGREES FAHRENHEIT AT STATION INDICATED (Calculated from U.S. Weather Bureau records for period 1908 to 1938 inclusive)
APPROXIMATE LOCATION AND EXTENT OF IRRIGATED AREAS
N
COLORADO
KANSAS
LAKE
CHAFFEE
PARK
FREMONT
TELLER
EL PASO
ELBERT
LINCOLN
CHEYENNE
CROWLEY
KIOWA
PUEBLO
OTERO
BENT
PROWERS
HUERFANO
LAS ANIMAS
HAMILTON
KEARNY
GREELEY
WICHITA
SCOTT
GRANT
HASKELL
STANTON
GRAY
FORD
MORTON
BACA
LEADVILLE
SALIDA
CRIPPLE CREEK
COLORADO SPRINGS
PUEBLO
JUNTA
LAS ANIMAS
CAMDEN
WALSENBURG
TRINIDAD
SPRINGFIELD
HUGO
EADS
TRIBUNE
SYRACUSE
LAKIN
JOHNSON
SUBLETTE
SCOTT CITY
GARDEN CITY
DODGE CITY
CIMARRON
BEAR VALLEY RESERVOIR SITE
35.6
44.7
47.7
48.4
45.4
47.9
48.8
52.2
50.9
51.9
52.6
53.8
54.5
54.6
54.7
55.0
55.3
55.5



INDEX MAP
ARKANSAS RIVER BASIN ABOVE DODGE CITY, KANSAS

e compiled from U.S. Geological Survey state base maps - 1:500,000



APPROXIMATE LOCATION AND EXTENT OF IRRIGATED AREAS

COLORADO WATER CONSERVATION BOARD
CLIFFORD H. STONE, Director
C. L. PATTERSON, Chief Engineer

ARKANSAS RIVER BASIN
IN COLORADO AND WESTERN KANSAS
AVERAGE TEMPERATURE
1908-1938

APRIL 1942 267-2277

 Drawn by [illegible] Traced by [illegible]

286-1861

Table of Contents

STREAM FLOW RECORDS

Period 1908-1938

	Page
Arkansas River at Canon City	2
Arkansas River at Pueblo	2
Arkansas River at La Junta	3
Purgatoire River near Mouth	3
Arkansas River at Caddoa (Calculated)	4
Arkansas River at Lamar	4
Arkansas River at Stateline	5
Arkansas River at Garden City Calculated 1908-1922, Recorded 1922-1938	5

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

Colo Ex 20
(Sheet 2 of 5

ARKANSAS RIVER AT CANON CITY, COLO.

Station Located in Sec. 32, T 18 S, R 70 W of 6th P.M. at Altitude 5,363 feet.

Drainage Area above Station 3,090 sq. mi.

Records by State Engineer and U. S. Geological Survey.

Values in Acre Feet are exclusive of upstream depletions and by-passed quantities.

Date 6-12-42

Checked J.B.S.

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT.	OCT.	NOV.	DEC.	ANNUAL	Accr-Depletion
1908	20000	19000	20000	22000	30000	81251	51620	34814	13062	15277	17268	17000	341271	232759
1909	16000	15500	18000	29000	45130	170480	124080	73480	81170	38800	31300	25090	668970	531280
1910	26440	19360	33960	48320	111650	110680	39720	29150	20530	21090	17730	18238	497068	360030
1911	18718	16319	23336	17070	65393	152547	134957	56556	26638	73453	32222	23009	638618	450961
1912	20301	16671	21272	20251	80375	166991	143598	54957	22719	22243	20065	21100	619535	464885
1913	20906	20469	21090	26301	66898	96813	60442	26901	23802	23058	21064	21828	428752	300757
1914	21800	19300	21800	20700	69500	165000	151000	81200	28600	27900	21600	25700	659900	518800
1915	23700	19500	22800	32600	47500	125000	81200	42900	26500	25100	22300	22100	491000	355700
1916	22600	20000	33600	31300	67000	139000	112000	83600	30200	29500	30300	29200	668000	469100
1917	28800	29800	21000	23300	50500	177000	142000	57200	28400	17100	19400	21000	615000	434000
1918	20200	23100	22200	20000	60900	200000	85500	48700	32700	25600	25600	23700	588000	447800
1919	28700	21200	25100	30700	99000	105000	84200	48700	34000	26900	28100	30500	582100	421600
1920	22900	21500	22900	18200	67000	177000	108000	75000	32200	25800	30300	27500	628300	477600
1921	23100	18100	19100	20000	61500	201000	129000	87000	38900	29300	27800	26600	661700	517600
1922	22600	19700	22000	22000	76200	137000	71400	52500	27100	17800	20900	20700	512900	389800
1923	17100	15300	19700	20200	58000	142000	136000	82400	47500	16600	36900	29100	651100	494100
1924	28200	25900	21600	40900	97800	177000	76200	55000	18600	20100	19600	20800	605000	469500
1925	20700	16200	17600	12000	60900	69600	62100	37900	26100	22900	19900	20000	365900	216600
1926	17900	17100	19600	27900	66200	129000	89800	59500	18600	15200	20500	18000	498300	390000
1927	17700	16100	21600	19300	78700	132000	103000	64200	45700	30900	23800	21100	603100	432900
1928	25500	18100	19400	17800	80600	120000	91600	59300	21600	17500	18800	20800	511300	395300
1929	19600	15600	20500	22400	58500	124000	78100	93500	66600	33900	26700	21900	581300	443100
1930	21600	23100	19600	32300	47500	99400	62500	65800	25000	17800	18900	20100	455900	339500
1931	18800	16700	17900	19300	42200	55600	27900	16100	11200	11300	12500	20700	270000	172300
1932	15900	15900	15200	14300	68200	115000	91600	48700	21700	16000	17000	15300	456800	359500
1933	18400	20100	13300	11400	36800	136000	57200	28300	19000	15000	11600	18900	389200	288000
1934	16900	13600	12100	16200	68100	34200	18700	19000	11900	11800	12270	16150	215750	169300
1935	15160	12730	10980	9820	20900	114200	99710	68810	28550	23380	20620	20500	466770	366380
1936	19160	15030	12350	33300	118600	119500	77950	88920	32640	26900	21270	20600	586900	470900
1937	15650	14380	17780	23520	77870	81260	58880	32160	15870	13160	12090	19620	382500	283510
1938	18420	15170	15160	18980	63090	163300	86600	53330	31060	29120	21640	22060	535810	411860
AVGE	20459	18206	20475	23814	61466	130510	98756	54166	29398	21871	22319	22071	513767	391166

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

ARKANSAS RIVER AT PUEBLO, COLO.

Station Located in Sec. No. T 20 S, R 65 W of 6th P. M. at Altitude 4675 feet.

Drainage Area Above Station 4730 sq. mi.

Records by State Engineer and U. S. Geological Survey.

Values in Acre Feet are exclusive of upstream depletions and by-passed quantities.

Date 6-1-43

Checked T.B.C.

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV.	DEC.	ANNUAL	Accr-Depletion
1908	21800	22200	16500	23428	29532	77716	55242	32500	7031	13610	11824	18400	336083	229969
1909	17200	16700	16300	17600	40766	159538	114983	71830	108479	45993	33798	28280	671467	515136
1910	27790	23490	32960	43200	107780	107820	45320	26070	11460	15860	16900	15312	476908	344990
1911	15898	15255	20357	12889	67755	131758	126581	60060	27564	63678	37210	24456	603455	466681
1912	19052	15870	17500	17930	71324	171066	137798	59531	25206	20854	17757	18800	643168	483935
1913	17032	18327	17419	23266	61400	84880	58536	21398	21719	22074	18744	23673	390888	276419
1914	21300	19500	23700	27800	86100	189000	190000	113000	30300	33000	25750	23800	783250	636800
1915	30700	20400	25600	45000	56300	130000	83000	53900	25500	30600	23600	25100	549100	393700
1916	25000	18900	30900	27800	69500	126000	103000	71600	20900	27600	27900	25200	577100	421600
1917	31200	19600	16700	17000	43000	166000	134000	57200	26600	19900	19800	15700	556400	414000
1918	17500	10600	12100	13000	68300	179000	65800	21200	20800	12600	11500	18600	467600	343100
1919	21000	16000	17500	50500	98800	100000	86100	46200	34100	21900	26100	29000	549500	421700
1920	20200	14600	14800	13600	58300	153000	98200	77500	30900	18600	30600	27900	559800	425900
1921	21500	12200	11500	20100	57500	397000	172000	81200	31100	25200	31300	34700	895300	758900
1922	27600	21100	18600	14900	70100	118000	70700	45700	21300	15200	23600	22000	466700	340700
1923	14900	12100	12500	15800	57600	119000	157000	125000	72000	60100	30980	34600	731300	546200
1924	27600	29500	21000	46900	87900	176000	66400	46900	13300	17600	19300	17800	568800	437000
1925	22000	13000	13500	6130	33700	60100	58700	35800	21200	21600	16800	19100	321630	216480
1926	16700	12300	12500	29900	70700	117000	88700	54300	13400	18000	21100	17900	484500	372000
1927	18700	10700	19500	13400	64600	125000	97200	60600	33900	37300	29300	22900	533100	394700
1928	22600	14200	15300	12300	79300	112000	89800	60400	21500	16200	23900	21800	490200	378500
1929	20000	18900	17000	13500	58900	107000	87900	152000	82100	39500	39500	28000	661400	501500
1930	22600	21600	15300	25200	41100	85700	60600	89200	30700	17100	23000	20000	456500	332500
1931	16100	10300	11600	16100	45800	68700	18400	8620	7680	9720	13300	15700	221820	116100
1932	13000	10500	9780	8210	55700	105000	86700	43700	15700	13300	15300	18000	388890	315010
1933	11200	10800	5500	6130	42500	131000	55100	33100	9940	5210	10600	13800	334980	278070
1934	14000	9160	5700	9100	51700	20500	8100	11600	5060	6810	5310	6990	151310	106660
1935	7810	6810	3070	4670	29820	135600	95780	60170	27720	16720	21790	15410	421870	352760
1936	11580	10700	4320	21970	110500	107000	74290	103600	25230	24500	23530	17810	535030	442590
1937	13620	16210	12110	18180	70070	65100	44130	31170	11140	8570	11590	11770	317180	241060
1938	12080	9800	7780	12160	41230	131300	78770	53760	49850	23260	25940	17820	485360	389360
AVGE	18457	15536	15417	20683	64498	127812	87134	58564	28724	21011	23885	20613	502764	384644

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

ARKANSAS RIVER AT LA JUNTA, COLO.

Station located in Sec. 2, T 24 S, R 55 W of 6th P. M. at Altitude 4058 feet

Drainage Area above Station 12,200 Sq. Mi.

Date 6-17-43

Record by State Engineer, U. S. Geological Survey and A.V.I.D.A.

Checked J.H.E.

Values in Acre Feet are exclusive of upstream depletions and by-passed quantities.

JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL	Apr-Sept	Oct-Mar
7080	5100	2400	400	2900	15700	17000	7690	1230	45000	2600	7000	126520	44220	82300
2100	400	700	650	3200	33800	35700	32500	66700	12600	9600	11600	193250	156450	36800
3400	14500	8000	6660	17200	19800	38900	25500	1340	650	4800	2680	155570	109600	45970
681	2810	1430	1160	11500	29600	32900	9700	3140	16700	9530	8180	134061	97160	36901
4950	1060	798	3020	15277	29218	38343	31070	7148	11204	17884	5882	175269	121376	53893
5420	28714	3126	9521	11538	20964	13502	3258	1467	9121	8152	4303	91598	63600	30998
2780	1680	7260	10600	46700	158000	65800	11200	6490	11200	6430	6450	373790	334790	39000
5410	1590	7130	16100	38300	113000	22100	17300	9916	12600	6810	1980	279810	247060	32770
12000	9950	3650	12300	21300	23600	21500	30500	2560	5760	3950	4080	155070	111760	40310
2080	778	3120	4660	23500	28700	34680	13500	1330	5560	10100	3920	135918	109590	25858
862	1050	4060	5610	13000	33500	18600	9280	7910	9210	17900	3750	119831	83700	36131
924	916	1230	2100	10600	18400	15100	9720	15100	2030	6610	4510	87300	71020	16280
4850	1510	6150	3610	15900	30800	25900	9780	7910	10800	1930	1350	117900	93900	24000
2820	983	1820	7800	23500	607000	160000	99000	10900	11900	7500	3550	919075	887900	31173
8260	1200	1940	3870	11200	34200	20100	5870	2200	1720	10600	6890	111660	78850	32810
3610	2580	1190	2580	11900	23600	47000	138000	55200	16800	5880	13500	361160	281280	79880
13000	26600	2950	12900	23800	54500	20600	3680	1830	6000	6840	1940	201308	117210	87230
796	896	3470	2170	12800	17700	37900	9900	6010	10600	9060	8000	112808	86780	26028
8220	2170	8360	5780	18500	17600	17900	6950	2250	9230	13000	5770	96680	62980	33700
1140	8270	7320	6010	20800	35570	48000	64000	10900	17800	16600	4540	235000	185210	49790
1860	3280	1300	3500	12200	73800	27100	11800	3430	6940	9220	6520	160550	131230	29320
1560	3600	2680	1810	12600	28700	29700	92800	12900	15200	5760	4660	211690	178310	33380
1330	2570	1430	5400	12100	27800	11000	31600	10800	5880	8090	3810	125160	99000	26160
847	1120	2790	5000	15100	12100	1610	2900	2880	1160	1550	3030	53207	16590	10617
1480	2080	2370	1980	16600	29000	31700	23100	4060	5480	7140	1180	129050	109260	19810
1158	9060	1530	3120	56500	56800	19500	11700	7800	2300	3550	7130	178260	157580	20720
1470	1400	2430	2950	15900	1480	2060	3130	6600	1805	599	1980	40398	35170	11228
2080	1140	1530	1350	11100	11120	33340	13120	10330	8710	10020	8420	172800	140960	31840
1200	2260	1050	5710	13160	20060	52300	97840	12320	18280	11530	6010	275040	231690	43350
2900	2750	3220	9630	32180	28860	10600	6600	21600	1540	3310	6300	129690	109490	20200
9130	5090	2900	6800	23590	31960	30810	10890	36830	11190	10620	8050	192720	142960	49780
3960	3960	3600	5390	20630	51770	30780	19210	11600	10730	8060	5210	184160	152380	31800

Substitution figures are calculated from other records.

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

PURGATOIRE RIVER AT MOUTH NEAR LAS ANIMAS, COLO.

Station located in Sec. 1, T 25 S, R 53 W of 6th P. M.

Drainage Area above Station 3,320 sq. mi.

Date 6-3-43

Record from State Engineer, Amsley Investigations, Kans. Irrig. Commissioner and Meeker-Knapp estimate

Checked T.H.C.

Values in Acre Feet are exclusive of upstream depletions and by-passed quantities.

JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL	Apr-Sept	Oct-Mar
1860	1580	687	5960	3340	14120	26700	28200	1750	4800	4880	254	83631	70370	13261
2000	310	1200	7560	2690	22600	27800	32100	53400	1790	1500	1750	155200	146350	8770
980	1190	293	29400	8160	2560	13200	13050	1780	5280	1140	413	77386	68350	9036
570	1510	369	945	5700	6150	19800	1860	299	2310	1050	2160	42723	34750	7969
980	1960	1670	4870	10600	35300	11000	7430	12000	3960	1590	860	89710	79200	10510
1180	1690	1500	615	238	8060	1670	128	11100	665	2610	2500	31926	21811	10115
1270	425	1400	358	59900	22900	69800	26400	442	325	0	1160	284360	199800	4560
1810	1190	2000	30900	61900	30300	15900	23000	1430	1900	1420	2540	174260	163410	10850
770	476	2370	11000	1910	238	200	30460	20	6720	2670	1600	61524	46918	14606
1510	825	1120	8290	17800	444	7150	11350	9620	2070	2060	286	61805	54154	7651
5080	1480	4170	5130	1130	3600	21400	7300	8320	7670	5500	8900	79870	46870	33000
310	1780	4370	11500	15400	7540	20600	13000	12600	8050	7150	1430	103530	80460	23090
720	1530	740	1200	6740	5800	7500	17300	8470	18300	1360	2100	71179	46410	24769
1390	966	1620	6980	5500	18900	19600	20700	2580	1690	3610	1230	86556	74260	10296
1420	1930	1780	1390	1090	2710	7300	4160	440	490	1270	1670	25700	17090	8610
2980	1330	1000	504	5180	62500	50800	166000	33900	49200	13700	6870	390604	316884	73520
5830	11200	5520	16400	4300	1360	3020	4480	60	267	1190	984	54611	29620	24991
664	2030	1200	212	2300	3830	46700	25000	3080	1660	2040	1790	89556	80158	9404
8180	2340	2530	17300	22400	17400	13800	2710	42	488	2240	1560	84970	73698	11278
3870	1050	836	266	111	657	81800	95300	15800	5550	1460	892	204774	193916	10858
1150	3110	627	2640	4440	12900	3520	7560	238	2140	1800	2850	115835	103258	11977
3480	2500	5470	2120	6210	17700	11700	75600	3570	590	774	1720	131644	116900	14744
1350	2050	1010	393	5650	2210	14800	39700	9940	36600	1900	3780	119383	72693	46690
3570	7110	11100	11700	12700	6840	565	1270	1100	726	1030	1090	58801	34175	24626
1010	1780	1210	1900	1600	4390	7070	2370	8	184	863	449	22834	17338	5496
1170	4000	668	184	10300	6960	6760	19600	15600	455	643	904	67234	59404	7830
567	816	830	167	812	1810	8730	3520	12100	121	89	280	29822	27139	2683
307	28	12	0	22860	6360	13590	10630	13020	617	837	761	69025	66460	2565
594	463	98	67	18550	3840	15260	21380	883	1430	735	636	66756	62980	3776
112	473	724	354	1960	22220	8340	10200	21080	1390	873	823	72179	66054	6125
557	684	1120	809	6690	11660	16130	6750	11790	2360	1380	1130	64070	56839	7231
1500	1929	1905	5940	11881	12388	19074	23598	8715	5482	2237	1766	96116	81596	11820

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

Colo Ex 204
(Sheet 4 of 5)

ARKANSAS RIVER AT CARDOA, COLO.

Station located in Sec. 7, T. 23 S., R 50 W of 6th P. M.
Drainage Area above Station 10,210 sq. mi.
Prior to March 1938 all values calculated from other Records. Since Mar. 1938 record by State Engineer.
Values in Acre Feet are exclusive of upstream depletions and by-passed quantities.

Date Rev. Apr. 1942
Checked

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL	[illegible]
1908	21100	8800	4100	3900	2600	26000	121400	53400	5300	107500	8200	9100	296300	13500
1909	6300	4900	1100	5300	4800	52900	43900	66100	128100	12700	11500	11900	350100	30100
1910	18400	17800	10300	2000	25000	19500	44000	52400	2300	3800	5900	5400	231900	16980
1911	3600	3300	8000	1600	17300	25100	60600	7700	1700	21900	13350	15100	180600	11160
1912	8300	13100	11600	12000	20200	62100	37100	59000	19300	12600	15900	7700	284900	21000
1913	5900	3700	8400	10400	8800	28300	12300	1600	5600	9000	11800	9900	119500	6890
1914	9500	9400	11600	14600	159000	191000	146100	72600	7200	12500	10300	8800	645600	58150
1915	6600	7200	10100	67900	89500	134000	35300	90300	14600	17000	12900	7300	493400	43160
1916	12300	16600	7300	17400	20700	28600	22100	79400	6500	11500	11000	8400	232900	16000
1917	14700	7000	5500	7700	28200	28800	35800	19000	12100	9500	12700	6800	198700	13500
1918	6300	5900	9500	11100	9600	31600	30400	9700	15600	11200	14300	9600	168400	11100
1919	3700	5200	9000	24300	29500	25200	31900	21400	15600	5800	11000	7700	190300	14700
1920	7400	5200	6400	5600	13700	29100	36700	25200	17700	21200	8600	7500	191300	13200
1921	6900	5400	5700	11600	25000	666300	183500	136500	11700	15200	11600	6200	1085600	103600
1922	8600	5300	6800	8700	13000	26200	25900	14800	1400	2000	10800	8500	136000	9000
1923	6900	6000	6400	2500	27100	23800	103300	288400	98600	114000	32800	25500	805100	61350
1924	55200	4100	29300	39600	23800	50300	19100	4500	600	4100	6900	6500	249100	14300
1925	5600	4200	5600	1100	13500	22300	106300	42500	9200	12400	14500	8000	245500	17430
1926	7400	6200	10200	21000	28700	33100	28400	7600	1000	1400	12900	6900	167800	12280
1927	5400	3800	6700	5300	11500	30100	133300	168500	20700	21700	19400	7500	435000	31450
1928	5900	6200	4500	4700	21300	136500	31300	10600	3600	6600	13200	13400	313000	26300
1929	9200	7300	6900	4000	12600	33600	32100	157720	17900	17400	12100	11100	322600	25780
1930	9200	8000	6900	4800	15700	28300	18800	54200	22700	40500	11800	13400	233900	14450
1931	4800	8300	9800	12800	24900	18200	3000	2700	2500	1500	2500	4300	96300	6100
1932	2800	4400	5700	3200	12100	27600	29500	21200	3300	3400	5800	2100	119900	9900
1933	2800	5500	21000	3800	81400	52600	26600	48600	30900	2700	4300	9800	271100	24600
1934	7100	59000	4200	2300	13100	5000	8600	3400	26900	1400	1400	2000	81300	5950
1935	2700	1300	1600	1200	51300	57700	44000	19800	22100	9100	9500	7700	228300	19600
1936	5200	3100	2000	3300	62000	20600	68900	121800	11400	19500	12000	7500	337300	29800
1937	4000	4800	4700	7200	22100	56800	11500	8500	45900	2600	3500	7500	181300	15400
1938	8600	6200	3400	5000	21640	38240	48900	12830	46950	15230	13710	11680	241170	17365
AVGE.	9200	8510	7210	11540	31590	66860	48610	54100	20410	17730	11330	9060	295710	23807

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

ARKANSAS RIVER AT LAMAR, COLO.

Station Located in Sec. 30, T 22 S, R 46 W of 6th P. M. at Altitude 3610 feet.
Drainage Area above Station 19,800 sq. mi.
Records by State Engineer, U. S. Geological Survey and A. V. D. A.
Values in Acre Feet are exclusive of upstream depletions and by-passed quantities.

Date 6-12-42
Checked J. B. S.

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL	[illegible]
1908	25300	7100	280	70	270	14000	17300	44000	100	139000	3700	5900	257020	15360
1909	4800	1800	340	310	1120	31000	18400	44700	117900	1430	3830	14300	239930	20340
1910	20000	18700	3400	4100	4100	80	29800	53900	330	140	100	1300	136000	9236
1911	2100	130	1500	50	8800	150	47300	1400	50	1500	4500	15000	77480	5270
1912	9600	26700	14800	5300	1500	34000	7000	62400	9800	120	160	4700	177380	12000
1913	4900	4400	5700	3700	3500	5410	1014	131	213	121	183	5417	35475	2356
1914	8120	3780	61	60	176000	165000	116700	50900	572	1050	2560	5200	538072	51723
1915	8670	4340	1680	63700	71300	115000	15200	83600	7380	572	1230	6130	381802	35618
1916	11300	17700	769	982	609	18100	1010	99000	1610	307	6160	6810	1181.87	7508
1917	21500	5460	160	208	2070	2260	2120	188	1050	1160	253	1330	41080	3906
1918	5890	8000	2300	1560	1220	16660	4370	1860	3160	290	684	1700	38894	17030
1919	5260	6930	11200	33600	19800	2590	9900	10200	660	806	10700	10100	121746	76750
1920	10900	2760	996	1170	1160	981	18500	11100	8090	10300	8870	7870	83047	18127
1921	7870	6330	4910	696	1510	648000	190000	138000	8960	990	450	5160	1019666	1017668
1922	8120	10500	4170	1680	566	657	2130	5900	101	125	357	1090	35876	11314
1923	346	337	363	150	21800	71100	76200	267000	81500	181000	35300	26900	706999	521050
1924	59000	51600	43000	38900	4920	26800	648	216	137	212	210	6760	231023	70661
1925	8120	4120	304	141	4610	8030	91700	34700	1330	106	8098	5010	160866	11351
1926	9410	4380	361	2660	3080	11500	6330	1060	71	87	774	2360	46013	21461
1927	5600	1210	1300	868	206	839	117000	161000	3330	220	886	4330	300583	22554
1928	7690	713	290	256	68100	134000	6580	579	1280	375	2560	16800	238623	23079
1929	12000	9160	2050	321	578	2660	2750	127000	1080	537	11800	13300	183666	15181
1930	13300	10500	3950	308	1700	3760	836	17500	11800	32300	6660	16800	119214	39901
1931	4660	6000	2600	4500	2560	2970	202	192	137	127	546	1260	25894	10561
1932	1760	1050	670	167	373	2500	3160	2510	129	119	179	198	12816	8839
1933	280	1160	175	125	70100	18000	5040	41700	21900	815	802	821	162116	159965
1934	353	894	197	179	1130	309	2690	719	25400	123	119	189	32962	30887
1935	272	161	87	107	26500	31760	17380	5720	7140	186	144	768	90697	88087
1936	2550	2540	402	388	76660	7870	54430	92280	616	489	281	716	238562	231646
1937	1120	2170	338	304	481	30500	1260	1050	27600	153	133	699	66878	64215
1938	436	431	189	190	3570	17660	22720	2520	19280	274	837	2670	70777	69960
AVGE.	9160	7190	3650	5360	18510	46170	28630	43640	11710	10130	3680	6150	193660	153480

Underwritten figures are calculated from other records.

Page 5

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

Colo Ex 204
(Sheet 5 of 5)

ARKANSAS RIVER AT COLO.-KANS. STATELINE*

Station located in Sec. 14, T 21 S, R 42 W of 6th P. M.

Drainage Area above Station 25358 sq. mi.

Records by State Engineer and U. S. Geological Survey.

Values in Acre Feet are exclusive of upstream depletions and by-passed quantities.

Date 6-3-43

Checked T.H.C.

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL	Apr.-Sept.	Oct.-Mar.
08	15884	9140	8757	1131	898	25646	8239	8608	416	144000	22136	17954	560803	44952	515871
09	17954	10884	8521	992	492	27192	28563	38491	23600	10883	9521	17078	213781	189381	24400
10	15000	13000	11314	9640	5103	8975	26614	56507	595	615	595	15414	119402	77464	41938
11	8293	3269	3933	1005	8289	8011	33495	8785	298	3388	20582	21904	107186	47817	59369
12	12800	20837	25264	8216	1047	36659	6394	67299	11406	6143	11940	12755	222720	133981	88739
13	30688	21659	11019	1910	357	9408	17553	1076	833	885	1333	10576	115285	33131	82154
14	16000	8780	3980	2430	172000	189000	106000	54800	1530	3940	5030	13010	576500	527760	48740
15	13500	11200	14100	69600	79300	146000	23500	98600	12900	6090	7140	12000	495730	429700	66030
16	18100	28100	9600	1460	572	7140	781	48200	9100	3850	8690	10050	144343	69953	74390
17	16500	9550	5980	2668	2260	2968	8370	4520	1400	2950	1390	1410	59410	18960	40450
18	6330	4550	4870	2010	1680	5710	7990	2560	6310	2900	5180	8730	58850	26290	32560
19	5250	8030	21200	80900	29100	3060	9220	22900	1280	5570	16200	20200	225910	149460	76450
20	18400	9890	9450	5210	5610	2960	29100	49600	25600	19100	13700	15600	199220	118080	81140
21	14100	11200	12900	3040	1970	585000	161000	114000	5950	5370	4960	11900	961390	900960	60430
22	14300	18600	13500	12700	7870	1290	683	13200	339	315	2770	8120	93667	36082	57605
23	1440	6890	1470	2080	41800	101000	82400	272000	89800	121000	40500	34400	800780	589000	211700
24	70839	58305	40170	49430	13260	31320	4050	2644	2754	3800	4860	11130	292561	103458	189103
25	15190	11440	5040	2668	10090	16900	11403	40150	6660	6640	15530	9770	253978	190468	63510
26	16470	13610	14650	6790	8880	21060	11050	2138	1906	1898	4330	7070	102852	54824	48028
27	11150	7030	6660	3220	2207	2102	128380	256010	17210	5520	6120	12760	452869	143129	49740
28	21220	9840	6820	3760	43140	131890	12360	3910	3450	3870	8520	20630	264190	201510	62680
29	16960	12930	10640	4090	1870	7120	3660	129690	11010	7650	21750	21020	250790	159840	90950
30	15290	18980	9730	3640	12000	6300	3630	26210	15320	56320	16000	22080	205190	67100	138330
31	13730	20170	20620	15120	8780	8110	1882	2302	1165	1598	1979	6380	107220	37948	69271
32	10050	8000	1160	2900	2365	11000	2870	5550	1523	1936	1758	2216	50256	30106	20150
33	5160	5460	3193	2338	28450	12140	10710	60520	32510	2980	1030	5540	172966	146662	26303
34	5760	5370	5500	2198	4760	4310	9220	1042	11390	1788	1202	1556	54096	32920	21176
35	8580	1503	1666	1358	38080	49170	46920	21350	15623	3180	3600	5230	193210	175451	17759
36	5109	7203	3076	1472	111370	29890	54957	113470	1832	1420	5250	7004	345033	312971	32062
37	1110	7108	1668	2279	1164	40840	2915	1166	60320	1594	1829	3828	132336	108883	23453
38	1365	3284	2580	1850	15960	43330	37790	6850	65820	1220	6790	8120	204159	174600	29559
39															
08	11083	12291	9290	10114	21398	50766	31238	50350	16552	23950	8876	11892	260710	180347	80325

* Includes Holly Drain 1934 to 1939 inclusive.

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

ARKANSAS RIVER AT GARDEN CITY, KANS.

Station located in Sec. 19, T 24 S, R 32 W of 6th P. M.

Drainage Area above Station 30,623 Sq. mi.

Records by Kansas State Board of Agric. and U. S. Geological Survey.

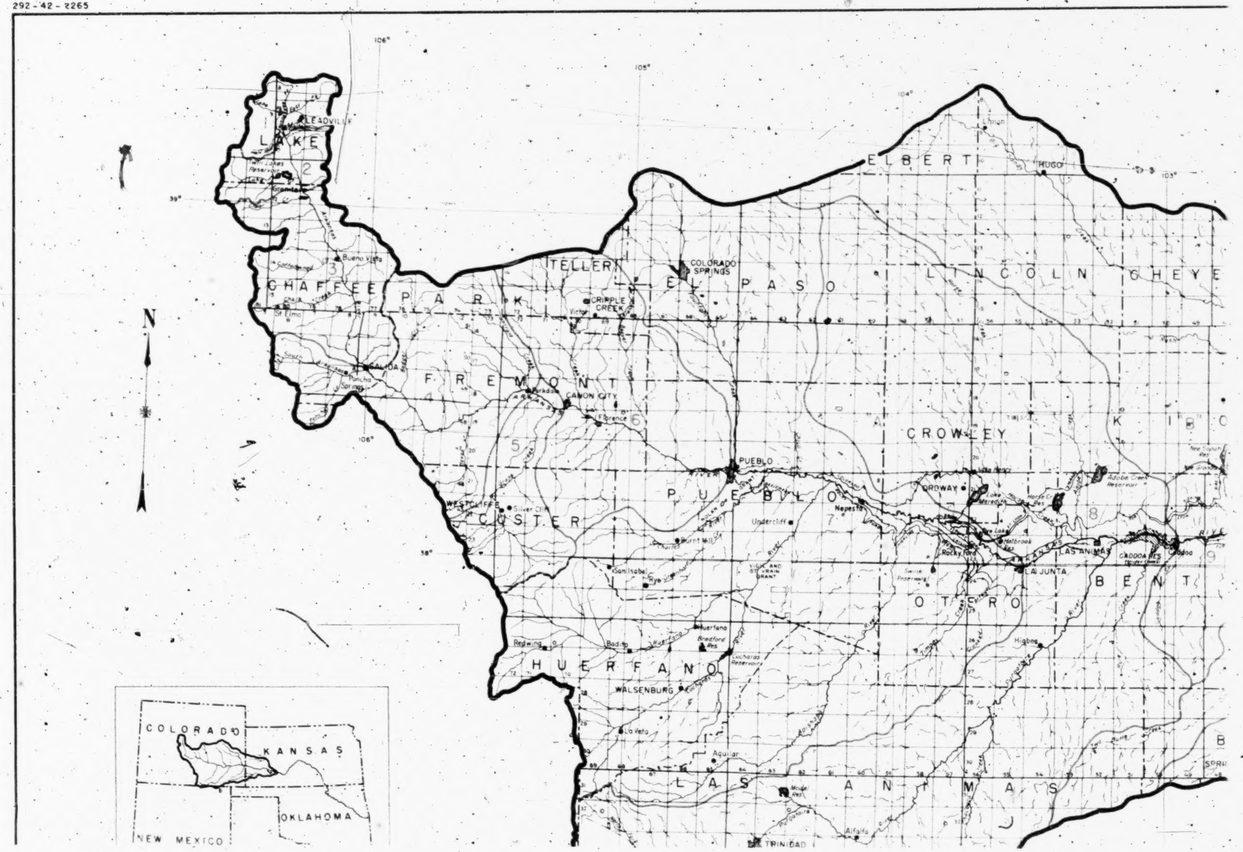
Values in Acre Feet are exclusive of upstream depletions and by-passed quantities.

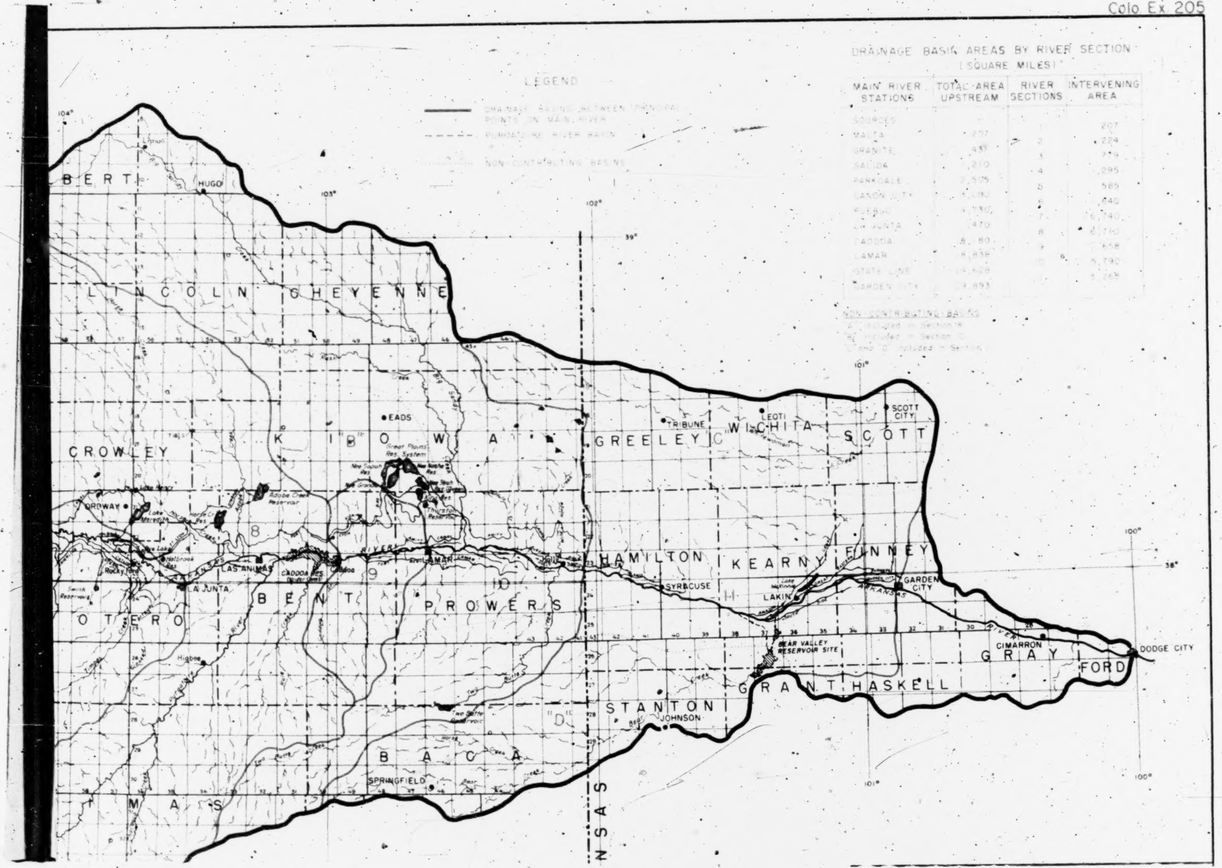
Date 6-25-43

Checked J.R.E.

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL	Apr.-Sept.	Oct.-Mar.
08	1080	7540	1260	0	0	2950	1140	910	0	364100	18220	14800	430000	5000	425000
09	5220	1090	710	650	0	18810	19540	24230	63770	3170	2780	5030	147000	129000	18000
10	4440	4030	3700	3010	1570	950	0	18470	0	0	200	430	37000	24000	13000
11	1400	1380	1660	340	2960	0	12720	960	0	1430	8430	10500	42000	17000	25000
12	5930	10090	12230	4130	510	18300	3210	33680	7170	2990	5590	6170	110000	67000	43000
13	15700	12610	7150	820	0	3160	4010	10	0	660	700	5400	52000	10000	42000
14	11490	7210	3240	1800	130700	143650	82080	61620	1160	3230	4130	10680	461000	401000	60000
15	12070	10000	14380	56900	64740	119250	19170	80600	10560	5450	6380	10720	410000	351000	59000
16	8530	13210	7650	1010	50	2040	0	11700	2700	1800	4080	4730	52000	17000	35000
17	3650	2130	1320	910	840	1090	870	1670	1620	650	320	930	16000	7000	9000
18	4470	3350	3590	140	20	440	710	0	670	2140	3820	6430	26000	2000	24000
19	1770	2730	7200	5440	18480	1970	5840	14570	2700	1900	2500	6900	92000	95000	26000
20	5830	3160	1420	3490	3730	1980	9490	33190	12120	6150	4380	5010	105000	79000	26000
21	12000	10000	8000	2500	1800	517000	140000	127700	10000	28070	25870	62060	945000	799000	146000
22	10000	6000	1169	10000	3000	988	32	0	0	73	183	595	32000	14000	18000
23	676	878	873	898	82100	71400	47230	214000	95800	185000	53300	41400	768525	540398	228127
24	43500	88200	55500	76200	13800	5560	81	0	40	201	1050	7300	291435	95681	195754
25	6400	7280	1160	893	707	856	56800	31700	171	10	1330	1590	107827	90057	17770
26	6220	1980	478	739	178	102	0	0	0	10	899	589	10525	1019	9506
27	670	721	858	528	54	135	70100	129000	1510	514	1110	1310	206660	201327	5353
28	6520	2650	2020	2160	52200	145009	80900	1710	8	682	3790	19100	256720	221958	34762
29	10000	5310	5100	904	1270	115	0	81800	369	769	8450	13000	131217	81188	46729
30	5550	6410	2150	666	3760	613	0	959	232	34600	9830	22700	91280	6210	85070
31	11500	1500	5540	19800	5440	2130	24	208	40	80	20	122	49844	27062	22002
32	1450	2380	805	324	898	5730	0	0	0	61	119	123	11564	6546	5018
33	123	240	238	54	19700	246	0	15600	13500	54	793	619	51167	45100	2067
34	2420	2600	3780	159	71	0	0	0	1160	111	238	234	11006	1690	9316
35	123	111	0	0	27980	17460	26520	7490	1510	50	159	1280	82683	80960	1723
36	214	1060	89	10	63160	40750	14500	75610	1200	151	649	512	198185	196530	2655
37	305	3730	1400	69	0	11230	0	0	16860	0	179	264	34137	30569	5878
38	71	81	111	424	619	5030	8380	0	17780	119	528	3980	37123	32233	4890
39															
08	6930	7090	5160	7760	11430	36820	17900	31550	9610	20980	5540	8540	171050	116870	54180

Handwritten figures are calculated from other records.

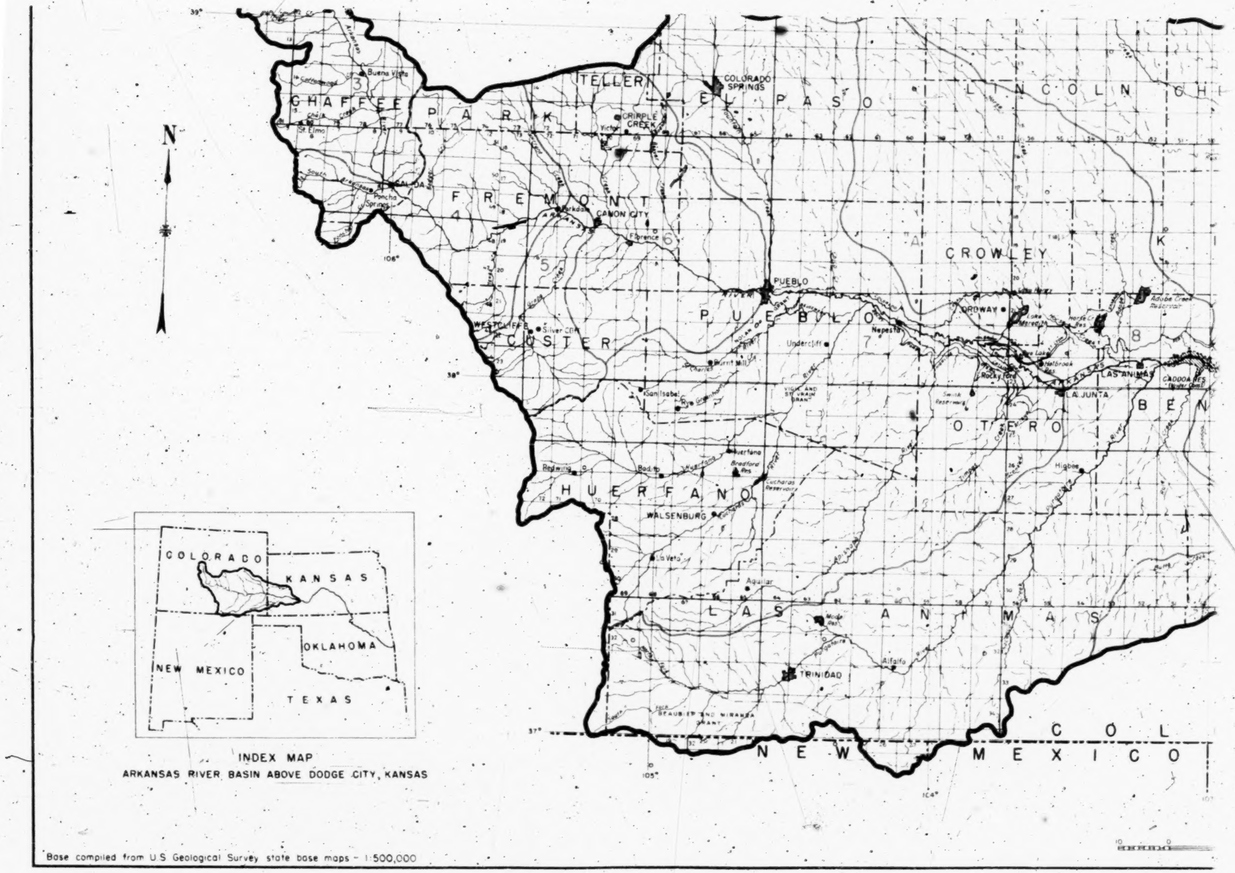


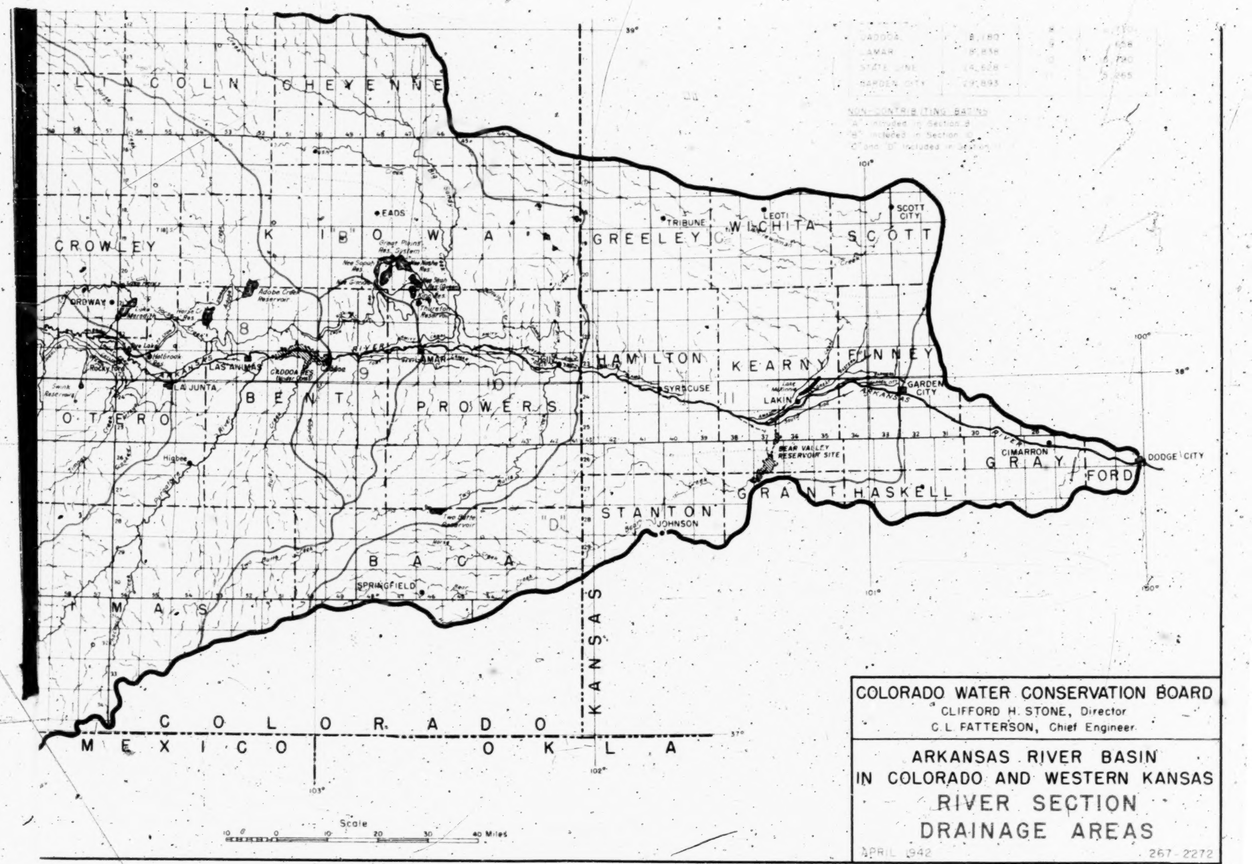


DRAINAGE BASIN AREAS BY RIVER SECTION
(SQUARE MILES)

MAIN RIVER STATIONS	TOTAL AREA UPSTREAM	RIVER SECTIONS	INTERVENING AREA
SOURCES	-	1	207
MALTA	207	2	224
GRANITE	431	3	779
SALIDA	1,210	4	1,295
PARKDALE	2,505	5	585
CANON CITY	3,090	6	640
PUEBLO	4,730	7	6,740
LA JUNTA	1,470	8	6,710
CADDOA	8,180	9	658
LAMAR	8,838	10	5,790
STATE LINE	14,628	11	5,768
GARDEN CITY	19,893		

NON-CONTRIBUTING BASINS
"A" included in Section 1
"B" included in Section 2
"C" and "D" included in Section 3





COLORADO WATER CONSERVATION BOARD
CLIFFORD H. STONE, Director
C. L. FATTERSON, Chief Engineer

ARKANSAS RIVER BASIN IN COLORADO AND WESTERN KANSAS
RIVER SECTION
DRAINAGE AREAS

APRIL 1942 267.2272

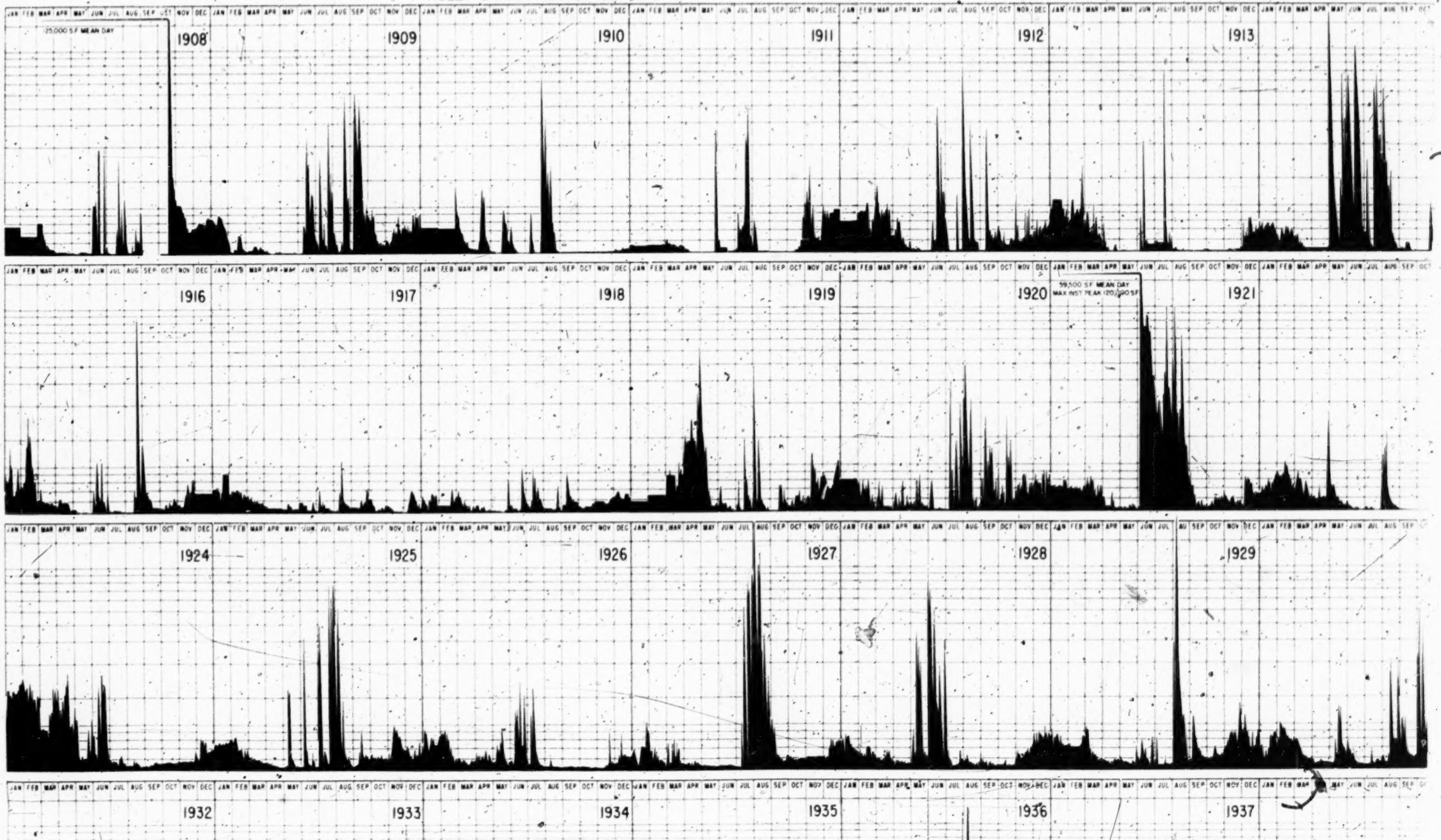
 Drawn by Traced by

COLORADO WATER CONSERVATION BOARD ENGINEERING DEPARTMENT C.C. PATTERSON, CHIEF ENGINEER

HYDROGRAPH OF THE ARKANSAS RIVER AT COLORADO-KANSAS STATE LINE.

MEAN DAILY VALUES IN SECOND FEET.

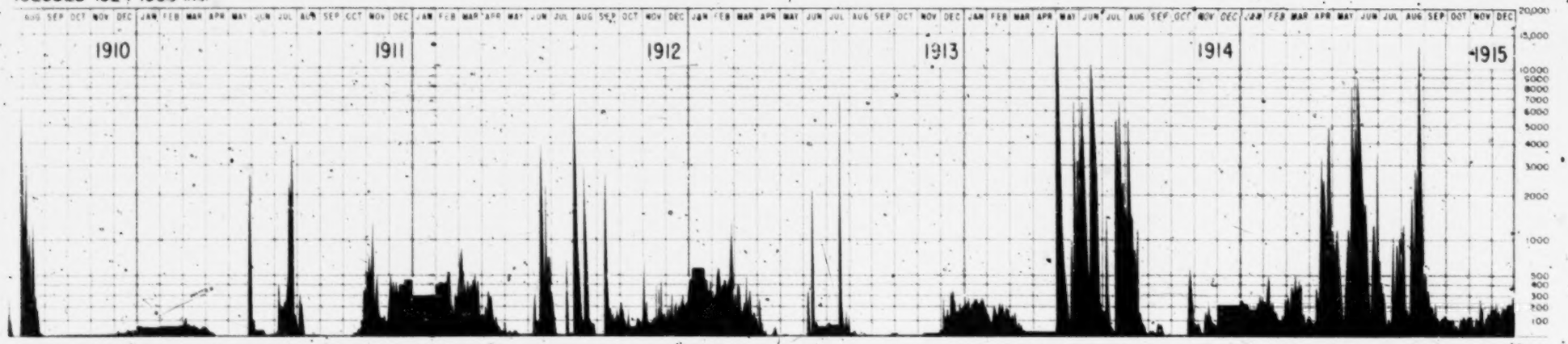
HOLLY DRAIN INCLUDED 1924-1938 Inc.

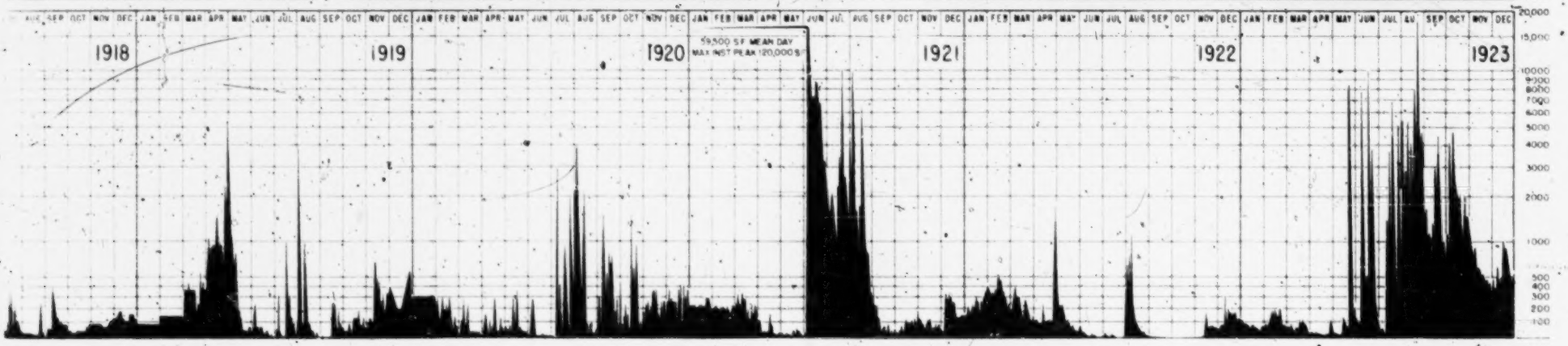


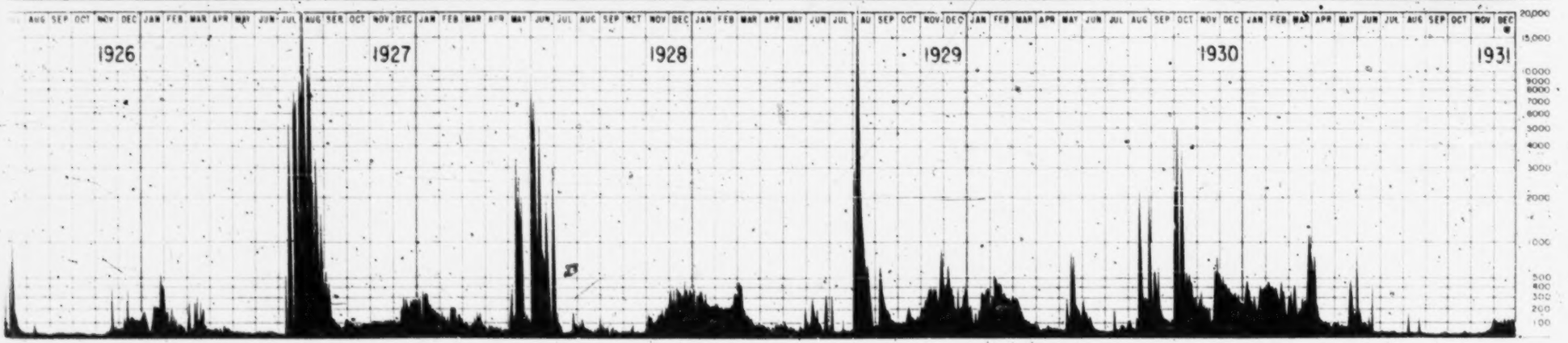
KANSAS STATE LINE.

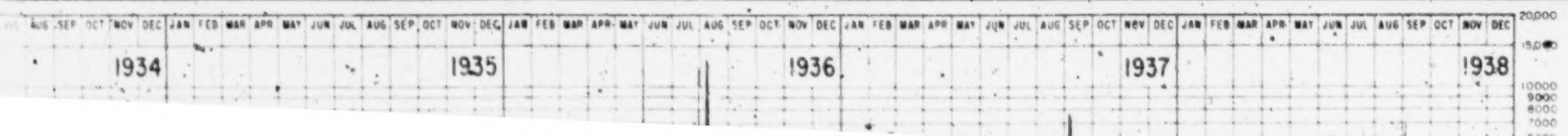
Colo. Ex. 208

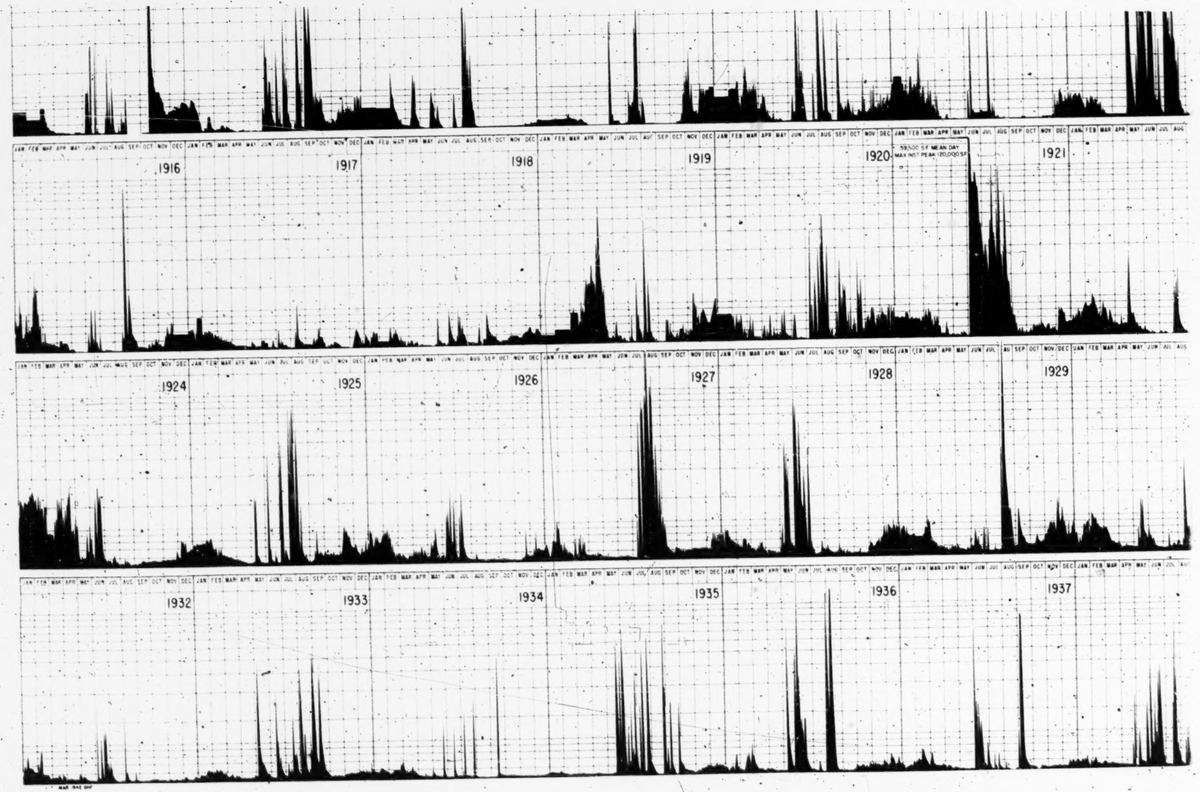
INCLUDED 1924-1936 Inc.

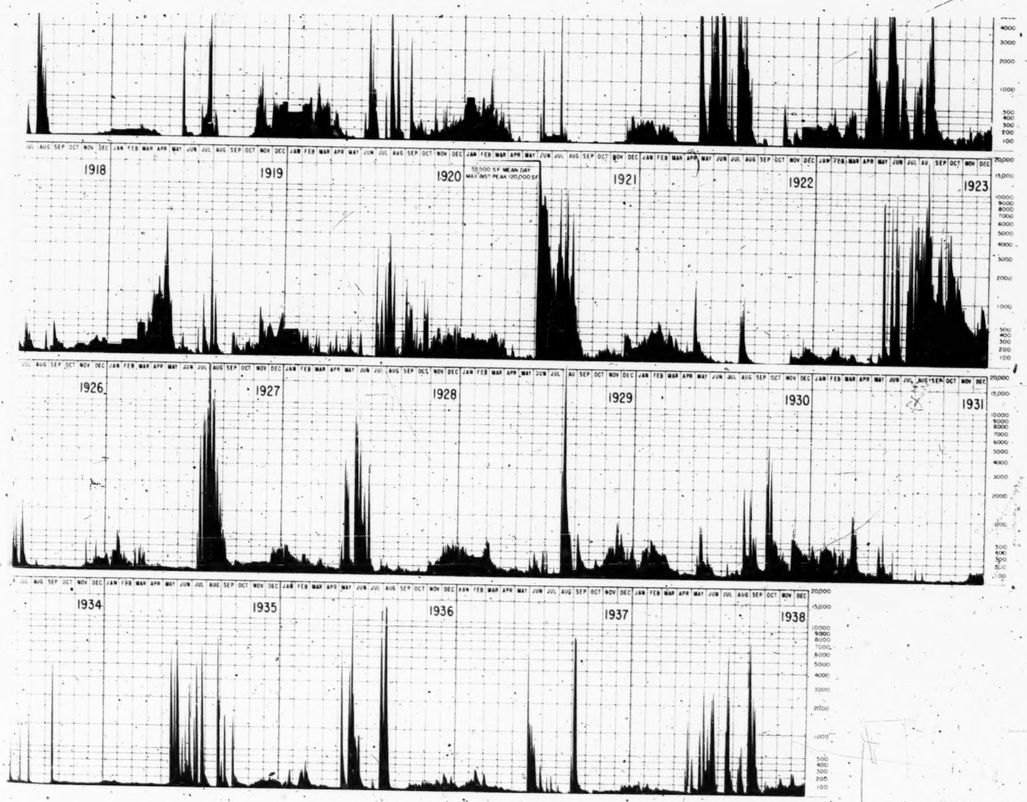









1916
1917
1918
1919
1920
1921
1924
1925
1926
1927
1928
1929
1932
1933
1934
1935
1936
1937


1918
1919
1920
1921
1922
1923
1926
1927
1928
1929
1930
1931
1934
1935
1936
1937
1938

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

Colo Ex 209

CADDOA RESERVOIR STUDY

ARKANSAS RIVER AT STATELINE

1909-1958

Values 1000 AF

Date 1962

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL	APR-SEP	OCT-MAR
8	15.9	9.1	8.8	1.1	0.9	25.6	8.2	8.6	0.4	142.0	22.1	18.0	560.8	44.9	515.9
9	18.0	3.9	2.5	1.0	0.5	27.2	28.7	38.5	93.6	10.9	9.5	17.3	251.4	189.4	62.0
10	15.0	17.0	11.3	9.6	5.1	3.0	2.6	56.9	0.6	0.6	0.6	4.4	119.4	77.5	41.9
11	3.3	3.3	3.9	1.0	8.3	2.0	33.5	8.7	0.3	3.4	20.6	21.9	107.2	47.8	59.4
12	16.2	20.8	25.3	8.2	1.2	36.7	6.4	67.1	14.4	6.1	11.5	12.8	222.7	134.0	88.7
13	36.7	21.7	14.0	1.9	0.4	9.4	19.6	3.1	0.8	0.9	1.3	10.6	119.3	37.1	82.2
14	14.0	8.8	4.0	2.4	172.0	189.0	106.0	9.8	1.3	3.9	5.0	13.0	576.5	527.8	48.7
15	13.5	11.2	16.1	69.6	79.5	146.0	23.5	98.4	12.9	6.1	7.1	12.0	495.7	429.1	66.6
16	18.1	28.1	5.6	4.2	0.6	7.1	0.8	18.2	9.3	3.3	5.7	10.1	111.2	70.0	71.3
17	16.5	8.6	5.9	2.5	2.3	2.9	2.4	1.5	1.3	1.0	1.4	1.1	58.4	19.0	40.4
18	6.3	1.6	1.9	21.0	1.7	5.7	8.0	2.6	6.3	2.9	5.2	8.7	98.9	26.3	32.6
19	5.3	8.0	21.2	80.9	29.1	3.1	9.2	22.9	1.3	5.6	16.2	20.2	225.9	169.5	76.4
20	15.4	9.9	4.5	5.2	5.6	3.0	29.1	16.6	25.6	19.1	13.7	15.6	199.2	118.1	81.1
21	14.1	11.2	12.9	3.0	2.0	585.0	161.0	116.0	8.0	5.4	5.0	11.9	961.4	901.0	60.4
22	13.8	18.6	13.6	12.7	7.9	1.3	0.7	13.2	0.3	0.3	2.8	8.1	93.7	36.1	57.6
23	4.4	6.9	4.5	2.1	11.8	101.0	82.4	272.0	89.8	121.0	10.5	34.4	800.8	589.1	211.7
24	70.8	58.3	10.2	149.4	13.3	31.3	14.1	2.6	2.8	5.8	4.9	11.1	382.6	103.5	189.1
25	18.2	11.4	5.0	2.7	10.1	16.9	111.0	14.2	6.6	6.5	15.5	9.8	234.0	190.5	43.5
26	16.5	13.6	14.2	6.8	8.9	24.1	11.1	2.1	1.9	1.9	4.3	7.1	102.9	54.8	48.1
27	11.8	7.0	6.8	3.2	2.2	2.1	128.4	266.0	11.2	5.5	6.4	12.8	467.9	403.1	64.8
28	14.2	8.8	6.8	3.8	45.1	131.9	12.4	3.9	3.5	3.9	8.5	20.4	266.2	201.5	64.7
29	17.6	12.9	10.6	14.1	4.3	7.1	3.7	129.7	11.0	7.7	21.8	21.0	250.8	159.8	91.0
30	15.3	19.0	9.7	3.6	12.0	14.3	3.6	25.2	15.3	56.3	16.0	22.1	205.5	67.1	138.4
31	17.8	20.2	20.4	15.1	8.8	8.4	14.9	2.3	1.5	1.6	2.9	6.3	107.2	37.2	69.3
32	10.1	8.0	4.2	2.9	2.4	14.9	2.9	5.6	1.5	1.9	1.8	2.2	58.3	30.1	28.2
33	5.2	5.5	3.1	2.3	28.5	12.1	10.7	60.5	32.5	2.9	4.0	5.5	173.0	116.7	56.3
34	5.8	5.4	5.5	2.2	1.8	1.3	9.2	1.0	11.4	1.8	1.2	1.6	54.1	32.9	21.2
35	2.6	1.5	1.7	1.4	38.1	149.2	16.9	21.3	15.6	5.2	3.6	5.2	283.2	175.5	17.7
36	5.1	7.2	3.1	1.5	111.4	79.9	54.9	113.5	1.8	1.4	5.3	7.0	345.0	313.0	32.0
37	4.3	7.4	4.2	2.2	1.4	14.8	2.9	1.2	60.1	1.6	1.8	1.8	132.5	108.9	23.6
38	4.4	5.3	2.6	1.9	16.0	43.3	37.8	6.9	65.8	1.4	6.8	8.4	201.5	171.6	29.9
39															
40	14.1	12.3	9.3	10.1	21.4	50.8	31.2	50.4	14.6	21.0	8.9	11.9	260.7	180.1	80.3

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

CADDOA RESERVOIR STUDY

ARKANSAS RIVER AT CADDOA

1948-1958

Values 1000 AF

Date 1962

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL	APR-SEP	OCT-MAR
48	2.1	0.8	1.1	3.9	2.6	26.9	49.4	53.4	5.3	107.5	8.6	5.1	266.5	134.5	161.8
49	2.9	1.1	5.3	1.8	58.9	43.9	66.1	138.1	13.7	11.5	14.9	11.2	369.1	301.1	68.0
50	18.9	17.8	10.3	25.8	25.8	19.5	14.0	52.4	2.3	1.8	5.9	5.4	251.9	169.8	82.1
51	5.6	3.9	8.0	1.6	17.9	25.1	60.6	7.7	1.7	21.9	13.5	15.1	180.4	114.6	65.8
52	8.3	18.1	11.6	12.0	20.2	66.1	37.1	59.0	19.9	12.6	15.9	7.7	288.5	218.3	71.2
53	5.9	5.7	8.4	10.4	8.8	28.3	13.9	1.6	5.8	9.0	11.8	9.9	119.5	68.8	50.7
54	9.5	9.4	11.6	19.0	18.0	146.1	72.6	7.2	12.5	10.3	8.8	6.5	345.6	283.5	62.1
55	6.8	7.4	10.4	67.9	89.5	134.0	35.3	90.3	14.6	17.0	12.9	7.3	493.4	431.6	61.8
56	12.3	16.6	7.3	17.4	20.7	28.6	22.4	70.4	6.5	11.3	11.0	8.4	252.9	166.0	86.9
57	14.2	7.0	5.5	7.7	28.2	28.0	35.8	19.9	12.1	9.5	12.7	6.8	188.7	132.5	56.2
58	6.2	5.9	9.5	14.1	9.6	31.6	30.4	9.7	15.6	11.2	14.3	9.6	168.4	111.0	57.4
59	3.7	5.2	9.0	26.3	29.5	23.2	31.9	21.4	15.6	9.8	11.0	7.7	190.3	147.9	42.4
60	7.4	5.2	6.4	5.6	19.7	29.1	36.7	23.2	17.7	21.2	8.6	7.5	191.3	132.0	59.3
61	6.9	5.6	5.7	11.6	25.0	666.3	183.5	136.5	11.7	15.2	11.6	6.6	1085.6	1034.6	51.0
62	8.6	9.3	6.8	8.7	13.0	26.2	25.9	11.8	2.4	2.0	10.8	8.5	136.0	86.0	14.0
63	6.3	6.0	6.4	2.5	27.1	93.8	103.3	288.4	30.4	11.0	12.8	25.5	805.1	613.5	191.6
64	58.2	14.1	29.3	39.4	29.2	52.3	19.1	14.5	0.6	4.1	6.8	6.5	293.1	145.1	148.0
65	5.4	4.7	5.6	1.1	13.5	22.3	106.3	12.5	9.2	12.4	11.5	8.0	214.5	134.9	50.6
66	7.4	6.2	10.2	21.0	28.7	53.1	28.4	7.6	1.0	1.4	12.9	6.9	167.8	122.8	45.0
67	5.4	4.7	5.6	30.1	13.6	133.3	168.5	29.7	21.7	18.4	7.5	7.5	435.0	371.5	63.5
68	5.9	6.2	4.5	4.7	71.5	136.5	54.8	16.0	3.6	6.6	12.2	13.6	313.9	263.9	50.0
69	9.2	7.8	6.9	4.0	12.6	53.6	32.1	157.7	17.8	17.4	18.4	11.1	322.6	257.8	64.8
70	5.2	8.0	6.5	4.8	15.7	28.3	18.8	54.2	22.7	16.5	11.8	13.4	235.9	144.5	89.4
71	2.8	8.3	9.8	12.8	24.9	18.2	3.0	2.7	2.5	1.5	2.5	4.3	95.3	64.1	31.2
72	2.3	4.6	3.7	3.2	12.1	27.6	29.5	21.2	5.3	3.4	5.8	2.1	119.3	96.9	22.4
73	2.8	5.5	2.4	3.8	81.4	52.4	26.5	18.6	30.9	2.7	4.3	9.8	271.1	213.6	27.5
74	7.1	5.9	4.2	2.3	13.1	5.0	8.6	3.4	26.9	1.4	1.4	2.0	81.5	59.3	22.0
75	2.7	1.8	1.6	1.2	51.8	57.7	14.9	19.8	22.4	8.1	9.5	7.7	228.5	196.9	31.4
76	5.2	3.1	2.0	3.3	62.0	20.6	68.9	121.8	11.4	13.5	12.0	7.5	357.3	288.0	69.5
77	4.0	4.9	4.7	7.2	22.1	56.2	14.5	8.5	45.9	2.5	3.3	7.5	181.3	154.4	26.9
78	8.6	6.2	3.4	5.1	24.6	38.2	18.9	12.8	50.0	15.2	15.7	14.7	213.5	179.7	61.8
79															
80	5.2	3.3	7.2	11.5	31.6	66.9	18.6	54.1	20.4	17.7	11.1	9.1	295.7	233.1	62.6

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

Colo Ex 210

CADDOA RESERVOIR STUDY

DIVERSIONS - CADDOA TO STATELINE

1908-1958

Values 1000 AF

Date 1962

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL	APR-SEP RC	U
1908	0.5	3.2	4.6	5.0	4.6	24.0	31.5	29.8	12.1	9.5	6.7	5.2	136.7	107.4	29.3
09	0.5	2.5	1.8	5.5	6.5	14.2	57.3	31.6	23.9	14.1	9.7	2.3	177.1	146.6	30.5
1910	0.6	0.5	3.1	20.7	30.9	24.1	14.3	11.8	5.4	5.9	9.2	7.0	142.5	110.1	32.4
11	3.8	4.5	9.3	4.4	12.5	28.3	32.6	8.6	4.4	27.3	11.1	3.0	145.6	86.8	58.8
12	0	0	0.8	12.3	21.6	35.6	31.6	19.0	15.2	12.3	4.7	5.0	178.1	115.1	63.0
13	0	0	5.1	11.2	8.9	36.3	19.1	5.2	3.8	13.1	4.1	7.1	109.8	78.3	31.5
14	5.5	8.7	13.3	22.5	19.0	25.3	30.0	24.0	12.6	15.5	14.0	6.4	198.4	135.6	62.8
15	0	6.7	7.1	19.8	14.7	18.7	24.6	25.2	13.5	23.2	17.0	3.8	174.2	124.0	50.2
16	0.7	3.0	9.5	17.2	25.7	25.5	25.9	22.5	11.8	14.7	9.5	3.6	169.5	129.1	40.4
17	0.9	3.1	8.6	9.6	25.7	35.9	40.1	24.7	16.2	13.8	15.9	8.4	203.7	154.3	49.4
18	2.7	0.9	10.6	19.0	11.9	34.8	30.5	11.6	10.5	13.5	13.5	6.3	172.8	127.1	45.7
19	0	0	.0	1.3	16.3	28.6	27.7	18.1	12.8	8.2	2.9	0.9	117.4	105.0	12.4
1920	1.3	4.9	6.9	9.4	23.2	32.4	31.6	15.5	13.1	12.6	5.6	5.6	171.2	151.2	19.0
21	0.8	1.7	4.1	11.0	30.8	12.6	13.5	12.9	11.2	18.0	13.7	2.8	136.1	97.2	38.9
22	0.8	0.2	5.4	10.5	14.7	27.5	29.7	17.1	4.7	5.9	12.9	8.1	138.4	114.1	24.3
23	7.8	7.4	8.2	6.4	15.5	32.8	35.8	14.4	24.1	7.7	4.2	0.9	165.3	129.1	36.2
24	0.5	0	0.5	8.2	31.8	30.8	23.1	7.4	3.7	7.1	9.5	2.9	125.6	102.1	23.5
25	0.0	1.9	9.0	5.1	14.1	22.1	34.5	19.2	12.8	15.4	9.3	6.4	149.3	107.7	41.6
26	0.2	1.1	15.9	29.0	18.7	29.3	28.6	12.8	4.6	6.2	17.3	6.2	155.4	135.9	19.5
27	1.4	1.9	7.8	11.1	13.2	34.1	25.0	13.4	18.8	25.1	22.7	3.6	181.6	111.8	69.8
28	0.9	6.4	8.2	11.2	25.7	20.4	35.3	21.8	9.1	11.6	13.5	0.2	161.3	126.5	34.8
29	0	0	6.9	9.5	15.0	25.8	30.6	29.8	24.1	23.1	5.5	1.2	175.2	138.6	36.6
1930	0.6	0.6	9.0	12.5	19.7	31.0	24.5	34.4	18.9	10.1	7.0	0.5	165.6	136.0	29.6
31	0	2.9	6.5	10.4	28.3	32.0	7.0	5.3	4.9	5.7	5.4	4.0	102.3	77.8	24.5
32	1.2	5.2	7.3	6.7	14.0	29.6	23.6	22.0	6.7	7.0	9.4	3.2	139.9	106.6	33.3
33	3.0	2.1	5.8	7.2	27.5	40.1	30.8	25.9	17.0	8.7	8.1	4.9	180.7	128.5	52.2
34	8.9	8.0	9.2	7.1	16.5	8.5	9.5	5.6	11.9	4.8	3.8	4.5	98.5	54.3	44.2
35	4.9	4.1	4.6	5.8	22.3	41.1	33.4	18.3	19.4	11.6	13.2	7.3	183.5	138.4	45.1
36	5.7	1.2	3.5	4.2	31.8	34.4	23.0	36.2	15.0	23.4	15.1	3.0	204.7	128.9	75.8
37	1.2	4.4	2.5	9.2	20.5	33.8	15.8	6.1	23.1	7.2	5.8	8.9	118.5	108.9	9.6
38	8.9	8.3	6.6	2.1	27.1	32.0	36.0	15.5	27.9	17.1	13.5	10.7	206.1	141.7	64.4
AVGS.	2.2	3.4	6.9	10.7	20.1	28.1	26.8	18.1	13.7	13.0	10.9	4.9	158.9	117.8	41.1

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

CADDOA RESERVOIR STUDY

ACCRETIONS - CADDOA TO STATELINE

1908-1958

Values 1000 AF

Date 1962

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL	APR-SEP RC	U
1908	-7.7	3.5	6.3	2.2	2.9	22.7	-2.6	-15.0	7.2	36.0	20.6	14.0	101.2	17.5	83.7
09	13.6	3.5	2.8	1.2	2.0	17.3	20.1	4.0	-11.6	11.3	7.7	4.7	78.5	31.9	46.6
1910	-3.3	-1.3	10.1	4.5	10.2	7.5	-27.1	19.0	3.6	2.7	3.8	3.1	30.0	17.7	12.3
11	2.7	3.9	5.8	3.8	2.8	1.3	5.5	3.6	3.0	8.8	10.4	12.8	72.4	20.0	52.4
12	3.9	2.7	14.5	8.5	2.4	10.1	0.8	27.3	9.7	5.9	12.4	10.0	108.3	58.5	49.8
13	24.8	19.0	10.7	2.7	0.4	11.6	24.7	4.4	-1.2	5.0	9.7	7.8	119.6	68.7	50.9
14	9.8	8.0	7.7	10.1	32.0	30.3	-8.1	6.2	6.9	7.9	8.8	10.6	129.3	77.4	51.9
15	6.7	10.5	12.8	21.5	4.5	30.7	12.6	33.3	11.8	12.3	11.3	8.5	176.6	118.9	57.7
16	6.6	11.9	7.8	4.8	5.6	14.1	4.3	9.3	11.4	7.3	7.0	5.2	81.0	32.6	48.4
17	8.7	7.6	9.0	4.3	-0.2	10.0	6.6	8.3	8.5	7.3	4.5	5.7	71.4	32.5	38.9
18	2.2	-0.5	6.6	7.8	4.0	8.9	8.1	4.2	7.2	5.2	4.4	3.4	65.2	40.4	24.8
19	1.6	2.8	12.2	55.9	15.9	8.5	5.0	13.8	4.5	8.4	8.1	13.4	153.0	100.0	53.0
1920	12.3	2.6	4.9	8.9	9.8	6.2	21.0	11.9	27.0	12.5	10.7	11.1	179.1	118.0	61.1
21	8.0	7.5	11.5	6.0	7.9	-8.7	-9.0	20.4	5.5	8.2	7.0	8.5	12.4	-38.2	50.6
22	6.5	10.2	12.1	11.5	9.5	2.1	4.5	15.7	1.6	4.2	4.9	7.7	95.9	50.6	45.3
23	5.3	8.3	6.3	6.0	10.2	10.0	14.9	-2.0	15.5	14.7	11.9	9.8	161.0	104.6	56.4
24	16.2	12.2	11.2	18.2	15.9	9.8	8.9	5.5	6.1	6.9	7.6	7.5	125.1	63.5	61.6
25	9.8	8.0	8.5	6.7	10.6	16.7	12.2	16.9	10.3	9.5	10.4	7.8	157.9	103.1	54.8
26	9.2	11.6	14.9	11.8	11.8	20.2	11.2	7.3	5.6	6.7	8.8	6.4	120.5	68.9	51.6
27	7.6	7.8	8.0	9.4	3.7	6.1	20.1	10.9	9.4	8.9	10.8	8.8	201.6	114.4	87.2
28	9.2	9.0	10.5	10.2	-1.5	18.8	15.9	9.7	7.9	8.8	8.9	7.1	111.6	58.2	53.4
29	7.8	5.1	10.6	9.4	6.6	3.4	2.2	1.7	17.3	13.3	11.9	11.1	103.4	48.6	54.8
1930	6.7	11.5	12.3	9.4	16.0	9.8	6.3	6.4	10.6	26.0	11.1	9.6	135.1	58.5	76.6
31	14.0	11.8	17.1	12.7	12.2	12.2	5.8	4.9	5.8	5.8	4.9	6.0	114.1	54.4	59.7
32	8.4	8.0	7.7	6.4	4.3	16.9	1.0	8.4	4.9	5.8	5.3	3.3	78.7	35.8	42.9
33	6.3	2.4	8.6	5.7	-0.4	4.0	15.0	37.2	18.6	8.8	8.2	8.6	91.5	54.9	36.6
34	7.6	7.9	10.9	7.0	8.2	7.8	9.1	1.2	-3.6	5.2	3.6	4.0	68.3	29.8	38.5
35	4.2	3.7	4.0	4.0	9.7	32.6	36.3	22.8	12.7	8.5	7.3	4.9	148.3	110.9	37.4
36	3.6	5.8	4.6	2.8	31.1	25.7	9.0	28.0	5.4	8.3	6.3	8.6	190.5	134.9	55.6
37	3.9	6.9	7.5	4.8	-0.2	18.6	4.2	-1.3	37.5	4.1	4.3	5.2	95.5	63.4	32.1
38	4.6	5.4	5.1	6.9	18.6	37.0	20.9	9.5	43.8	6.3	6.5	4.4	169.1	136.7	32.4
AVGS.	6.9	7.3	9.0	9.3	9.9	12.2	9.4	11.6	9.8	19.2	8.6	7.7	123.9	65.2	58.7

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

Colo Ex. 211

CADDOA RESERVOIR STUDY

DIVERTIBLE WATER IN ARKANSAS RIVER

AT COLO.-KANS. STATELINE

1909-1938

Values 1000 AF

Date 1942

YR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT	OCT.	NOV.	DEC.	ANNUAL	APR-SEP	OCT-MAR
09	15.9	9.1	8.8	3.1	0.9	25.6	8.2	8.6	0.4	35.9	22.1	18.0	156.7	46.9	109.8
10	18.6	3.9	2.5	1.0	0.5	26.4	25.9	61.7	10.9	9.5	17.3	20.0	201.0	138.9	62.1
11	16.0	13.0	11.3	9.6	5.1	3.0	2.6	44.5	0.6	0.6	0.6	1.4	107.4	65.5	41.9
12	3.3	3.3	3.9	1.0	8.3	2.0	28.3	2.7	0.3	3.4	20.6	21.9	102.0	62.6	39.4
13	32.2	20.8	25.3	8.2	1.0	30.7	6.4	36.3	13.1	6.1	11.5	12.8	186.4	95.7	88.7
14	30.7	21.7	14.0	1.9	0.4	9.1	3.6	1.1	0.8	0.9	1.3	10.6	105.0	22.9	82.1
15	14.0	8.8	4.0	2.4	2.9	96.1	56.9	45.3	1.5	3.9	5.0	13.0	315.9	267.2	48.7
16	13.5	11.2	10.1	5.5	5.0	71.9	23.5	62.4	12.9	6.1	7.1	12.0	345.2	279.2	66.0
17	18.1	28.1	5.6	1.2	0.6	7.1	0.8	23.4	9.1	3.8	8.7	10.0	119.5	46.1	73.4
18	16.5	9.6	5.9	2.5	2.3	2.9	2.4	4.5	4.4	3.0	4.4	4.3	59.7	19.0	40.7
19	6.3	4.5	4.9	2.0	1.7	5.7	8.9	9.6	0.3	2.9	5.2	8.7	58.9	26.3	32.6
20	5.2	3.0	21.2	67.2	28.6	3.1	9.2	18.6	4.3	5.6	16.2	30.2	207.4	131.0	76.4
21	18.4	9.9	4.4	5.2	5.6	3.0	27.2	43.1	25.6	19.1	13.7	15.6	190.8	109.7	81.1
22	11.1	11.2	12.9	3.0	2.0	105.3	110.2	84.0	6.0	5.4	5.0	11.3	366.9	308.5	60.4
23	11.5	12.6	13.5	12.7	7.9	4.5	0.7	13.2	0.3	0.3	2.8	8.1	93.7	36.1	57.6
24	6.4	6.9	4.5	2.1	11.5	53.2	53.1	110.6	77.6	37.1	10.5	5.4	368.1	318.1	188.0
25	28.8	38.3	14.2	14.4	13.3	3.3	4.0	2.6	2.8	3.8	4.9	11.1	292.6	103.5	189.1
26	15.2	11.4	5.0	2.7	10.1	12.6	57.2	30.2	6.6	6.5	15.5	9.8	183.0	119.5	63.5
27	16.5	13.6	4.6	4.8	8.9	24.1	11.0	2.1	4.9	4.9	4.3	7.1	102.8	54.8	48.0
28	11.2	7.0	6.9	3.2	2.2	2.1	52.3	89.1	11.2	5.5	6.4	12.8	209.9	160.2	49.7
29	8.2	8.8	6.8	3.8	37.5	73.2	12.1	3.9	3.4	3.9	8.5	20.4	196.6	133.9	62.7
30	17.6	12.9	10.6	4.3	4.3	7.1	3.7	54.4	11.0	7.6	21.8	21.0	175.5	84.5	91.0
31	15.3	19.0	9.7	3.6	12.0	6.3	3.6	26.1	15.3	44.1	16.0	22.1	193.2	67.0	126.2
32	18.8	20.2	20.4	15.1	8.8	8.4	1.9	2.3	1.5	1.6	2.0	6.3	107.2	37.9	69.3
33	10.0	8.8	4.2	2.9	2.4	4.9	2.9	5.6	1.5	1.9	1.8	2.2	58.3	30.1	28.2
34	5.8	5.5	3.2	2.3	20.9	11.9	10.7	16.1	28.9	2.9	4.0	5.5	117.2	120.9	26.3
35	5.8	5.4	5.9	2.2	4.8	4.3	9.2	4.0	7.6	4.8	4.2	4.6	58.5	29.1	21.2
36	2.6	1.5	1.7	1.4	26.8	36.5	31.8	16.4	15.6	3.2	3.6	5.2	146.2	128.5	17.7
37	4.1	7.2	3.1	1.5	43.0	29.7	13.5	48.6	4.8	4.4	5.2	7.0	270.1	138.1	32.0
38	4.1	3.7	2.7	2.2	4.1	33.0	2.9	1.2	26.4	1.6	1.8	3.8	90.6	67.2	23.4
39	4.4	3.3	2.6	4.8	13.8	41.9	28.0	6.8	45.8	4.4	6.8	8.4	171.2	141.3	29.9
AVG.	11.1	12.3	9.3	5.2	13.6	21.9	20.0	27.8	13.1	9.7	8.9	11.8	174.7	108.6	66.1

Includes diversions of Holly Drain at Stateline.

COLORADO WATER CONSERVATION BOARD — ENGINEERING DEPARTMENT

CADDOA RESERVOIR STUDY

UNDIVERTIBLE WATER IN ARKANSAS RIVER

AT COLO.-KANS. STATELINE

1908-1938

Values 1000 AF

Date 1942

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT	OCT.	NOV.	DEC.	ANNUAL	APR-SEP	OCT-MAR
1908	0	0	0	0	0	0	0	0	0	106.1	0	0	106.1	0	106.1
09	0	0	0	0	0	0.7	2.3	12.6	31.9	0	0	0	47.5	47.5	0
1910	0	0	0	0	0	0	0	12.0	0	0	0	0	12.0	12.0	0
11	0	0	0	0	0	0	5.2	0	0	0	0	0	5.2	5.2	0
12	0	0	0	0	0	0.0	0	31.0	1.3	0	0	0	38.3	38.3	0
13	0	0	0	0	0	0.3	10.0	0	0	0	0	0	10.3	10.3	0
14	0	0	0	0	97.1	100.9	53.1	9.5	0	0	0	0	260.6	260.6	0
15	0	0	0	15.1	25.3	71.1	0	36.0	0	0	0	0	150.5	150.5	0
16	0	0	0	0	0	0	0	21.8	0	0	0	0	21.8	21.8	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	13.7	0.5	0	0	1.3	0	0	0	0	18.5	18.5	0
1920	0	0	0	0	0	0	1.9	6.5	0	0	0	0	8.4	8.4	0
21	0	0	0	0	0	481.7	60.8	60.0	0	0	0	0	592.5	592.5	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	24.3	47.8	29.3	161.4	12.2	23.7	0	0	298.7	275.0	23.7
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	4.3	56.8	9.9	0	0	0	0	71.0	71.0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	76.0	366.9	0	0	0	0	212.9	212.9	0
28	0	0	0	0	5.6	61.7	0.3	0	0	0	0	0	67.6	67.6	0
29	0	0	0	0	0	0	0	75.3	0	0	0	0	75.3	75.3	0
1930	0	0	0	0	0	0	0	0.1	0	12.2	0	0	12.3	0.1	12.2
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	7.6	0.2	0	11.4	3.6	0	0	0	25.8	25.8	0
34	0	0	0	0	0	0	0	0	3.8	0	0	0	3.8	3.8	0
35	0	0	0	0	11.3	12.7	15.1	7.9	0	0	0	0	47.0	47.0	0
36	0	0	0	0	68.6	0.2	11.4	61.9	0	0	0	0	171.2	171.2	0
37	0	0	0	0	0	7.8	0	0	33.9	0	0	0	41.7	41.7	0
38	0	0	0	0	2.1	1.4	9.8	0	20.0	0	0	0	33.3	33.3	0
AVG.	0	0	0	0.9	7.8	25.9	11.3	22.5	3.4	11.3	0	0	86.1	71.8	14.3

COLORADO WATER CONSERVATION BOARD -- ENGINEERING DEPARTMENT

Colo Ex 212

CADDOA RESERVOIR STUDY

WATER USED BY KANSAS - STATELINE TO GARDEN CITY

1908-1938

Values 1000 AF

Date 1942

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT	OCT	NOV	DEC.	ANNUAL	APR-SEP OCT-MAR
1908	2.8	1.6	1.5	1.1	0.7	22.7	7.1	7.7	0.4	77.9*	3.9	3.2	130.8	52.9 78.2
09	12.7	2.8	1.8	0.3	0.5	8.4	9.1	12.3	29.8	7.7	6.7	12.2	101.1	64.4 36.7
1910	0.4	0.4	1.6	0.6	3.5	2.0	2.6	38.0	0.6	0.6	0.4	1.0	51.3	53.3 -2.0
11	1.9	1.9	2.3	0.6	5.3	2.0	20.8	1.8	0.3	2.0	12.0	1.4	65.2	30.7 34.5
12	6.3	10.7	13.0	1.1	0.3	18.4	3.1	35.0	7.2	3.2	6.0	6.2	112.7	72.9 39.8
13	15.0	12.0	6.9	1.1	0.4	6.2	13.5	1.1	0.8	0.4	0.6	9.2	65.3	23.1 42.2
14	2.5	1.6	0.7	0.6	11.3	45.4	25.9	13.2	0.4	0.7	0.9	2.3	135.5	126.8 8.7
15	1.4	1.2	1.7	12.7	11.6	20.8	4.3	18.0	2.4	0.5	0.8	1.3	85.7	78.7 7.0
16	9.6	11.9	3.0	1.4	0.5	5.1	0.5	36.5	6.9	2.0	1.6	5.3	93.5	52.9 39.6
17	12.8	7.4	1.4	1.4	1.4	1.4	1.5	2.8	2.8	2.4	1.1	1.2	43.4	12.6 30.8
18	1.7	1.2	1.3	1.8	1.7	5.3	7.3	2.6	3.6	0.8	1.4	2.1	32.9	21.2 11.7
19	3.6	5.3	11.6	23.3	10.6	1.19	3.4	8.3	1.8	3.7	10.7	17.1	104.9	73.4 31.5
1920	12.6	6.7	3.0	1.7	1.9	1.0	9.6	16.4	8.5	13.0	9.3	10.5	91.2	57.1 34.1
21	2.1	1.6	14.9	0.5	0.2	68.0	21.0	10.3	-22.7	-0.9	-56.2	1.4	100.6	160.6 -59.8
22	1.3	12.6	12.8	2.7	1.9	0.3	0.7	13.2	0.3	0.2	2.6	7.5	61.7	28.1 33.6
23	3.5	2.0	3.2	1.2	19.7	23.6	35.2	29.0	-4.0	-6.0	-12.8	- 7.0	108.8	108.8 0.0
24	27.2	-9.7	-10.2	-22.8	- 0.3	25.8	1.0	2.6	2.7	3.6	5.8	1.8	1.1	7.8 - 6.7
25	8.5	4.2	3.9	1.8	9.4	11.6	57.7	8.1	1.9	1.9	1.0	6.5	126.2	98.3 27.9
26	10.1	11.6	4.2	1.1	8.7	21.0	11.0	2.1	1.9	1.9	1.0	6.5	98.3	55.8 42.5
27	10.5	6.3	5.8	2.7	2.6	2.0	38.3	122.0	4.7	5.2	5.1	11.1	216.2	201.8 14.4
28	7.7	6.2	4.8	1.6	- 9.1	-10.1	- 8.5	2.2	3.4	3.2	4.7	1.3	7.5	-20.4 27.9
29	7.0	7.5	1.5	1.2	3.0	7.0	3.7	17.9	10.6	6.9	13.6	8.0	110.6	75.4 35.2
1930	9.7	12.5	7.4	3.2	8.3	5.7	3.6	25.3	15.1	10.9	7.2	- 0.2	111.2	61.0 50.2
31	1.4	10.7	14.9	- 4.1	1.3	5.3	1.9	2.1	1.1	1.5	2.0	3.9	58.2	10.9 47.3
32	8.0	5.6	6.2	2.4	2.5	9.2	2.9	5.6	1.5	1.9	1.7	2.1	46.7	23.6 23.1
33	5.0	5.2	3.0	2.3	8.8	11.9	20.7	11.9	19.0	2.9	3.2	4.9	121.8	97.6 24.2
34	3.3	2.8	1.7	2.0	1.7	4.3	9.2	1.0	9.0	1.7	1.0	1.3	43.1	41.2 1.9
35	2.5	1.6	1.7	1.6	10.1	31.7	20.2	16.8	1.1	1.1	1.1	1.0	110.6	96.5 14.1
36	1.9	6.1	3.0	1.5	16.9	-10.9	10.4	37.9	0.6	1.3	1.6	1.4	81.8	116.6 -34.8
37	2.8	3.7	1.3	2.2	1.4	2.2	2.3	1.2	1.1	1.6	1.6	1.6	26.9	78.3 -51.4
38	1.7	3.2	2.5	1.4	15.3	38.3	27.4	6.8	18.0	4.3	6.3	4.4	127.3	142.3 -15.0
AVGE.	7.1	5.2	4.2	2.4	7.2	13.9	13.3	12.8	7.9	5.0	5.4	5.3	89.7	65.5 24.2

COLORADO WATER CONSERVATION BOARD -- ENGINEERING DEPARTMENT

CADDOA RESERVOIR STUDY

ARKANSAS RIVER AT GARDEN CITY

1908-1938

Values 1000 AF

Date 1942

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL	APR-SEP OCT-MAR
1908	15.1	7.6	7.8	0	0	3.0	1.1	0.2	0	56.1	10.2	11.8	150.0	0 150.0
09	5.2	1.1	0.7	0.7	0	18.8	12.5	21.2	63.8	5.2	2.8	5.0	147.0	129.0 18.0
1910	1.4	1.4	1.7	3.0	1.6	1.4	0	19.5	0	0	0.2	0.4	37.0	20.0 17.0
11	1.4	1.4	1.7	0.4	3.0	0	12.7	1.0	0	1.4	0.6	10.3	33.0	17.0 16.0
12	5.9	10.1	12.2	1.1	0.5	18.1	3.2	35.7	7.2	3.0	2.6	6.2	110.0	67.0 43.0
13	15.7	12.6	7.2	0.8	0	5.2	6.0	0	0	0.4	0.7	5.8	52.0	1.0 51.0
14	11.5	7.2	3.2	1.8	130.7	143.7	82.1	11.6	1.2	3.2	1.1	10.7	411.0	408.0 3.0
15	12.1	10.0	11.4	56.9	64.7	119.5	19.2	80.4	10.5	5.5	0.4	10.7	410.0	354.0 56.0
16	8.5	11.2	2.7	1.0	0.1	2.0	0	11.7	2.2	1.8	1.1	1.7	52.0	17.0 35.0
17	1.0	0.8	1.1	0.4	0.2	1.1	0.9	1.7	1.6	0.2	0.5	0.9	10.0	7.0 3.0
18	4.7	3.4	3.6	0.2	0	0.4	0.7	0	0.7	2.1	3.8	6.4	26.0	2.0 24.0
19	1.8	2.7	7.2	11.4	18.5	2.0	5.8	11.6	2.7	1.9	5.5	6.9	121.0	99.0 22.0
1920	5.9	3.2	1.4	3.5	3.7	2.0	19.5	11.2	17.1	6.6	4.4	5.6	105.0	73.6 31.4
21	12.0	10.0	8.0	2.5	1.8	517.0	140.0	127.7	10.0	28.1	25.9	42.1	945.0	795.0 150.0
22	10.0	6.0	1.1	10.0	3.0	1.0	0	0	0	0.2	0.2	0.2	32.0	1.0 31.0
23	0.7	0.9	0.9	0.9	22.1	71.4	17.2	213.0	95.8	185.0	53.3	11.4	702.5	186.4 516.1
24	45.5	88.2	95.5	76.2	13.8	5.6	0.1	0	0	0.2	1.1	7.3	233.4	95.7 137.7
25	6.4	7.1	1.2	0.9	0.7	0.3	56.3	31.7	0.2	0	1.3	1.6	107.0	90.1 16.9
26	6.2	2.0	0.5	0.7	0.2	0.1	0	0	0	0	0.5	0.5	10.5	1.0 9.5
27	0.2	0.7	0.8	0.5	0.1	0.1	70.1	129.0	1.5	0.5	1.1	1.6	205.7	201.1 4.6
28	6.5	2.7	2.0	2.1	92.2	145.0	20.7	1.7	0	0.2	3.8	19.1	256.7	222.0 34.7
29	10.0	5.4	9.1	0.9	1.3	0.1	0	81.8	0.4	0.8	8.5	13.0	131.2	9.5 121.7
1930	5.6	6.4	2.2	0.7	3.7	0.4	0	1.0	0.2	35.4	8.8	27.7	91.3	6.2 85.1
31	11.5	1.5	5.5	18.2	5.4	2.1	0	0.2	0	0	0	0.4	46.0	27.0 19.0
32	1.5	2.4	0.9	0.5	0.3	5.7	0	0	0	0.1	0.1	0.1	11.6	0.5 11.1
33	0.1	0.2	0.2	0.1	19.7	0.2	0	15.6	13.5	0.1	0.8	0.6	51.2	49.1 2.1
34	2.1	2.6	3.8	0.2	0.1	0	0	0	1.5	0	0.2	0.2	11.0	1.7 9.3
35	0.1	0.1	0	0	28.0	12.5	26.5	7.5	1.3	0.1	0.2	1.3	82.7	81.0 1.7
36	0.2	1.1	0.1	0	6.5	46.8	14.5	75.0	1.2	0.1	0.6	0.5	199.2	196.5 2.7
37	0.3	3.7	1.1	0.1	0	11.2	0	0	16.5	0	0.2	0.1	36.1	36.1 0
38	0.1	0.1	0.1	0.1	0.6	5.0	8.1	0	17.8	0.1	0.5	1.0	37.1	32.2 4.9
AVGE.	6.9	7.1	5.2	7.8	11.2	36.8	17.9	31.6	8.6	20.3	5.5	8.5	171.0	116.9 54.1

* Values calculated to July 1932, recorded thereafter.

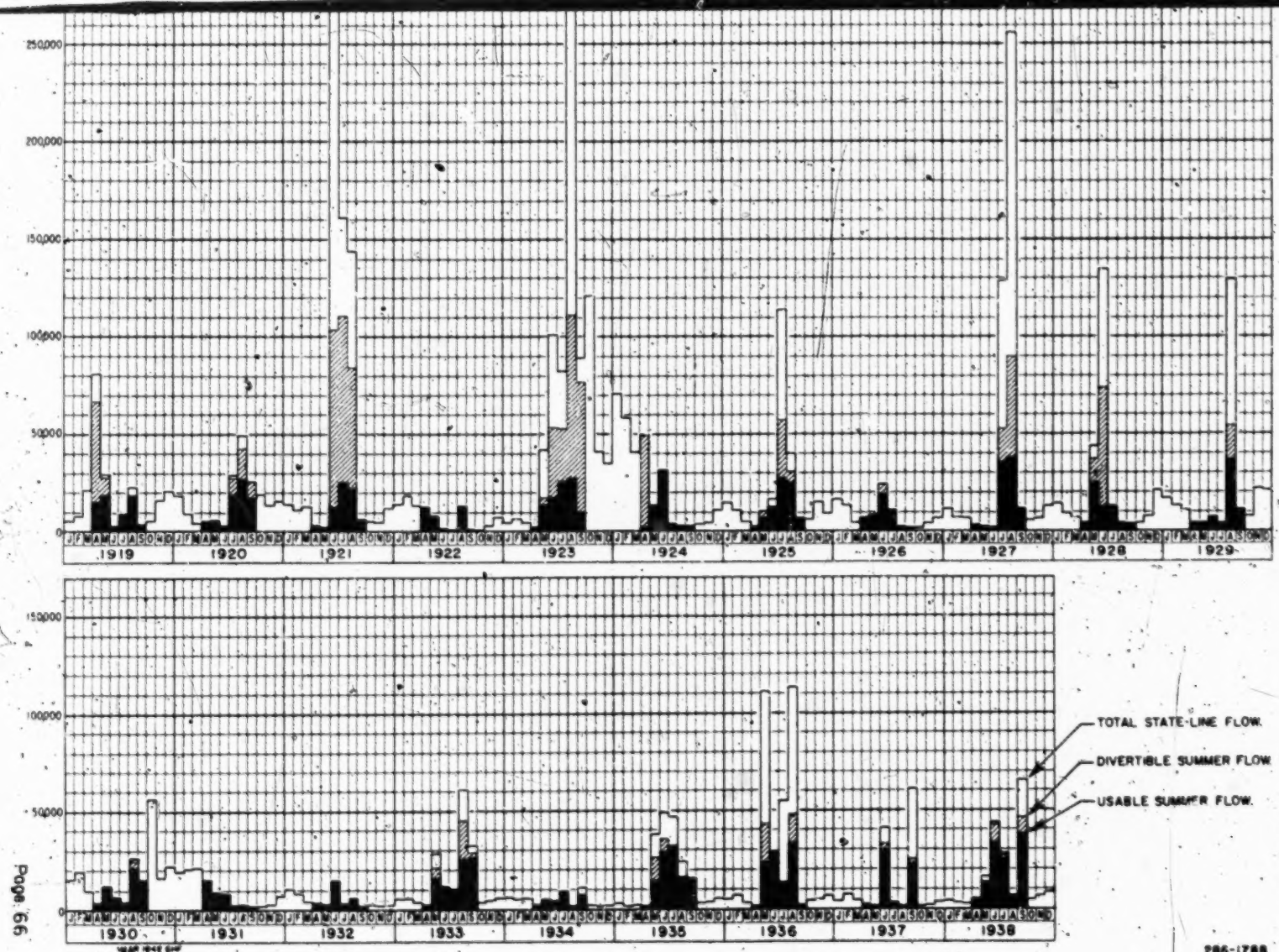
1937-1938

Diversions By Kansas Ditches
STATELINE TO GARDEN CITY
(Values - 1000 AF)
(Calculated)

J. R. E.

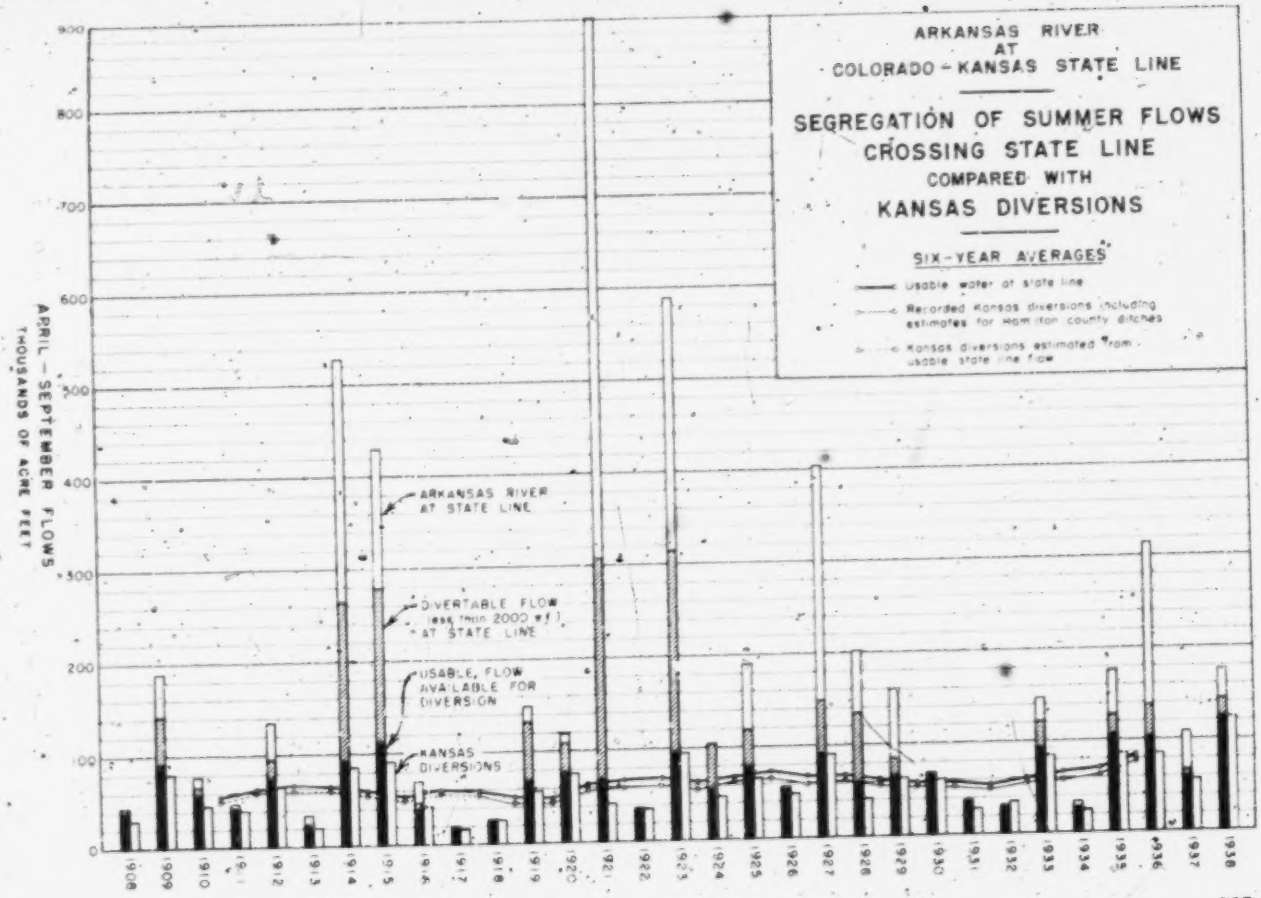
Year	ANNUAL Total	ANNUAL Syracuse Group	ANNUAL Garden City Group	SUMMER Total	SUMMER Syracuse Group	SUMMER Garden City Group	WINTER Total	WINTER Syracuse Group	WINTER Garden City Group
1908	45.0	6.1	38.9	30.0	4.9	25.1	15.0	1.2	13.8
1909	93.0	8.0	85.0	80.0	6.0	74.0	13.0	2.0	11.0
1910	57.0	6.1	50.9	45.0	4.8	40.2	12.0	1.3	10.7
1911	56.0	5.3	50.7	40.0	4.4	35.6	16.0	.9	15.1
1912	75.0	6.1	68.9	65.0	4.9	60.1	10.0	1.2	8.8
1913	29.0	2.7	26.3	20.0	2.6	17.4	9.0	.1	8.9
1914	96.0	13.7	82.3	85.0	9.0	76.0	11.0	4.7	6.3
1915	105.0	14.7	90.3	90.0	10.0	80.0	15.0	4.7	10.3
1916	82.2	5.8	76.4	41.4	4.4	37.0	40.8	1.4	39.4
1917	54.3	2.2	52.1	17.1	2.2	14.9	37.2	0	37.2
1918	69.3	3.9	65.4	26.9	3.4	23.5	42.4	.5	41.9
1919	99.0	8.5	90.5	58.5	6.0	52.5	40.5	2.5	38.0
1920	111.7	11.5	100.2	73.7	8.5	65.2	38.0	3.0	35.0
1921	71.0	6.4	64.6	41.6	5.0	36.6	29.4	1.4	28.0
1922	56.4	5.7	50.7	35.2	4.5	30.7	21.2	1.2	20.0
1923	116.6	13.5	103.1	93.2	10.0	83.2	23.4	3.5	19.9
1924	55.7	8.5	47.2	46.5	5.5	41.0	9.2	3.0	6.2
1925	117.5	10.5	107.0	65.0	7.0	58.0	52.5	3.5	49.0
1926	78.7	16.5	62.2	47.3	11.5	35.8	31.4	5.0	26.4
1927	127.8	11.5	116.3	89.4	7.5	81.9	38.4	4.0	34.4
1928	85.5	16.5	69.0	40.5	11.0	29.5	45.0	5.5	39.5
1929	123.4	11.8	111.6	62.0	8.0	54.0	61.4	3.8	57.6
1930	116.6	13.6	103.0	60.2	9.6	50.7	56.4	4.1	52.3
1931	61.9	12.3	49.6	28.5	8.5	20.0	33.4	3.8	29.6
1932	54.2	13.6	40.6	33.7	9.6	24.1	20.5	4.0	16.5
1933	110.6	17.2	93.4	81.2	11.5	72.7	26.4	5.7	20.7
1934	46.8	12.5	34.3	23.4	8.3	15.1	23.4	4.2	19.2
1935	102.1	14.5	87.6	86.2	9.5	77.7	16.9	5.0	11.9
1936	120.2	21.4	98.8	80.0	11.9	69.1	36.2	6.5	29.7
1937	69.9	15.3	54.6	55.6	10.2	45.4	14.3	5.1	9.2
1938	145.2	14.8	130.4	122.7	10.0	112.7	22.5	4.8	17.7
AVGE.	84.9	10.6	74.3	57.1	7.5	49.6	27.8	3.1	24.7

Note: Records for Garden City Group 1916-1938 from Kansas Water Bailiff's Reports, Reports of Kansas Irrigation Commission, and U.S.G.S. Water Supply Papers; 1908-1915 from analysis of Divertible and Usable Stateline Flows. Syracuse Group estimated from Diversions records of Garden City Group and stream flow records.



Colo. Ex. 214

286-1788



APRIL 1942

287 - 1794

CADDOA RESERVOIR STUDY

CHANGES IN CHARACTER AND AMOUNT OF STATELINE FLOWS

OPERATIONS PLAN F

Averages for 1908-1938: Values in 1000 A.F. Units

HISTORICAL CONDITIONS	ANNUAL	SUMMER	WINTER
1. Arkansas River at Stateline - recorded	260.7	180.4	80.3
(a) Unused in Kansas and wasted by Garden City	171.0	116.9	54.1
(b) Used in Kansas - diversions measured at Stateline	89.7	63.5	26.2
AFTER-CADDOA CONDITIONS			
2. Total Upstream Depletions	51.8	25.8	26.0
(a) Evaporation Loss at Caddoa Reservoir	14.8	10.9	3.9
(b) Depletions by Colorado after Caddoa Regulation	37.0*	14.9	22.1
3. Arkansas River at Stateline - depleted	208.9	154.6	54.3
(a) Unused in Kansas	79.6	51.5	28.1
(1) Caddoa Flood Spills	55.8	43.5	12.3
(2) Flood Crests, below	17.1	6.9	10.2
(3) Divertible but unusable	6.7	1.1	5.6
(b) Usable in Kansas	129.3	103.1	26.2
4. Increase in Kansas Usable Supply	39.6	39.6**	0.0

* Indicates Conservation Benefits to Colorado.
** Indicates Conservation Benefits to Kansas.

CADDOA RESERVOIR STUDY

CONSERVATION BENEFITS TO KANSAS

INCREASED USABLE STATELINE SUPPLIES OF SUMMER MONTHS

Period 1908-1938: Units 1000 A.F.

(1) YEAR	(2) HISTORICAL DIVERSIONS STATELINE*	(3) PLAN F STATELINE DELIVERIES	(4) INCREASED USABLE SUPPLIES
1908	36.4	82.5	46.1
09	86.4	111.0	24.6
1910	51.4	111.9	60.5
11	46.4	72.5	26.1
12	71.4	98.9	27.5
13	26.4	56.5	30.1
14	91.4	129.0	37.6
1915	96.4	126.0	29.6
16	47.8	116.5	68.7
17	23.5	99.5	76.0
18	33.3	70.3	37.0
19	64.9	117.5	52.6
1920	80.1	118.5	38.4
21	48.0	105.6	57.6
22	41.6	117.7	76.1
23	99.6	118.6	19.0
24	52.9	131.4	78.5
1925	71.4	108.3	36.9
26	53.7	104.5	50.8
27	95.8	108.4	12.6
28	46.9	100.2	53.3
29	68.4	111.6	43.2
1930	66.8	109.8	43.2
31	34.9	90.5	55.6
32	40.1	52.4	12.3
33	90.6	93.0	2.4
34	29.6	60.7	31.1
1935	91.6	98.9	7.3
36	90.4	149.9	59.5
37	62.8	93.9	31.9
38	129.1	129.6	0.5
AVGE.	63.5	103.1	39.6

Note: Summer months are April to September inclusive.

* Seasonal Diversions of Kansas ditches per Colorado Exhibit No. 213 were 6.4 less than values here shown.

CADDOA RESERVOIR STUDY

STATELINE DEPLETIONS - OPERATIONS PLAN F
Averages for 1908-1938: Units 1000 AF

Year (1)	Stateline Historical (2)	Caddoa Storage (3)	Storage Change (4)	Evap. Loss (5)	Increased Irrig. Depletions* (6)	Stateline Plan F (7)
		35.0				
1908	560.8	123.6	88.6	7.9	3.6	460.7
09	251.4	198.4	74.8	15.0	16.8	144.8
1910	119.4	88.5	-109.9	23.4	87.6	118.3
11	107.2	40.2	- 48.3	8.7	42.9	103.9
12	222.7	54.4	14.2	8.7	47.9	151.9
13	115.3	13.6	- 40.8	6.3	28.3	121.5
14	576.5	321.5	307.9	26.8	6.9	235.3
1915	495.7	322.1	0.6	25.1	26.3	443.7
16	444.3	160.9	-161.2	27.2	101.8	176.5
17	59.4	44.1	-116.8	13.3	50.1	112.8
18	58.9	21.1	- 23.0	7.7	1.1	73.1
19	225.9	28.3	7.2	5.5	35.6	177.6
1920	199.2	67.8	39.5	7.6	-15.2	167.3
21	961.4	256.1	188.3	24.3	75.7	673.1
22	93.7	57.1	-199.0	21.8	101.7	169.2
23	800.8	234.1	177.0	12.9	- 0.2	609.1
24	292.6	107.1	-127.0	21.6	52.5	345.5
1925	254.0	124.1	17.0	17.1	60.6	159.3
26	102.9	35.1	- 89.0	15.5	39.9	136.5
27	452.9	213.3	178.2	16.3	21.8	236.6
28	264.2	119.0	- 94.3	16.1	45.0	297.4
29	250.8	143.3	24.3	15.4	50.5	160.6
1930	205.5	107.6	- 35.7	15.9	51.1	174.2
31	107.2	7.1	-100.5	15.9	48.6	143.2
32	58.3	0.9	- 6.2	6.0	-18.7	77.2
33	173.0	77.4	76.5	12.2	-32.7	117.0
34	54.1	4.6	- 72.8	11.7	34.9	80.3
1935	193.2	37.1	32.5	13.7	17.8	129.2
36	345.0	92.2	55.1	15.4	78.7	195.8
37	132.3	43.2	- 51.0	12.7	41.0	129.6
38	204.5	68.2	27.0	10.6	12.0	154.9
AVGE.	260.7		1.1	14.8	35.9*	208.9

* Indicates Colorado benefits as measured by depletions of Stateline flows attributable to additional diversions and increased uses upstream from Stateline.

CADDOA RESERVOIR STUDY

OPERATIONS PLAN F

COMPARATIVE CONSERVATION BENEFITS
Period 1908-1938: Units 1000 AF

	Kansas Benefits			Colorado Benefits		
	Annual	10-year Averages	Percent of Total	Annual	10-year Averages	Percent of Total
1908	46.1			3.6		
09	24.6			16.8		
1910	60.5			87.6		
11	26.1			42.9		
12	27.5			47.9		
13	30.1			28.3		
14	37.6			6.5		
1915	29.6			26.3		
16	68.7			101.8		
17	76.0	42.7	53.9	50.1	41.2	49.1
18	37.0	41.8	50.5	1.1	40.9	49.5
19	52.6	44.6	51.0	35.6	42.8	49.0
1920	38.4	42.4	56.6	-15.2	32.5	43.4
21	57.6	45.5	56.0	75.7	35.8	44.0
22	76.1	50.4	55.0	101.7	41.2	45.0
23	19.0	49.3	56.3	- 0.2	38.3	43.7
24	78.5	53.4	55.5	52.5	42.9	44.5
1925	36.9	54.1	53.8	60.6	46.4	46.2
26	50.8	52.3	56.5	39.9	40.2	43.5
27	12.6	46.0	55.2	21.8	37.4	44.8
28	53.3	47.6	53.3	45.0	41.7	46.7
29	43.2	46.6	51.9	50.5	43.2	48.1
1930	43.2	47.1	48.6	51.1	49.9	51.4
31	55.6	46.9	49.8	48.6	47.2	50.2
32	12.3	40.5	53.6	-18.7	35.1	46.4
33	2.4	38.9	54.9	-32.7	31.9	45.1
34	31.1	34.1	53.1	34.9	30.1	[illegible]
1935	7.3	31.2	54.7	17.8	25.8	45.3
36	59.5	32.1	51.9	78.7	29.7	48.1
37	31.9	34.9	51.8	41.0	31.6	48.2
38	0.5	28.7	50.4	12.0	28.3	49.6
AVGE.	39.6		52.5	35.9		47.5

TABLE 16

RETURN FLOW, ARKANSAS RIVER,
Canyon City to Holly, Colorado.
R. I. Meeker, Irrigation Engineer.

Year	Acre-feet	Remarks
1912	140,000	
13	112,000	NOTE: Return flow deduced for 5-year
14	198,000	period, 1922 to 1926. Average 240,000 acre-feet.
15	199,000	Using 240,000 as a base figure, return flows com-
1916	175,000	puted for each year according to yearly ditch
17	188,000	diversion percents using 1,080,000 acre-feet
18	194,000	as base figure for ditch diversions; period of
19	208,000	application 1922 to 1930.
20	260,000	Return flow 1910 taken at 130,000 acre-feet (Patterson)
		" " 1921 " " 220,700 " "
1921	200,000	Yearly values between 1910 and 1920 interpolated,
22	218,000	and modified according to yearly percents of ditch
23	288,000	diversions using 1,100,000 acre-feet as the base of
24	250,000	ditch diversions.
25	204,000	
1926	240,000	
27	247,000	
28	257,000	
29	266,000	
30	228,000	
Totals	4,072,000	
Mean	214,000	

RETURN FLOW VALUES, ARKANSAS RIVER, CANYON CITY TO HOLLY.

River Section	Period	Average Acre-ft. per year	Mean Sec.-ft.	Monthly Range Sec.-ft.
1. Canyon City to Pueblo	1922 to 1926	15,000	21	9 to 30
2. Pueblo to La Junta	1922 to 1926	113,000*	156	97 to 206
3. La Junta to Lamar	1922 to 1926	49,000	68	39 to 100
4. Lamar to Holly	1922 to 1926	65,000**	90	73 to 107
Total		242,000	335	218 to 443

* Includes Salt Creek and Return Flow from Arkansas water used on tributaries.

** Includes drainage water intercepted by Amity Canal and Holly Drain.

ARKANSAS RIVER

A Suggested Permanent Method of Division of the Water
Which will also Protect Storage in and Utilization of Caddoa Reservoir
through
Key Measuring Stations Above

Acre Feet

Year	Corrected Arkansas River at Canon City	Purgatoire River at Mouth (Colo. Ex. 204)	Total	50% of Total
1908	396,271	83,631	479,902	239,951
1909	701,970	155,120	857,090	428,545
1910	567,408	77,386	644,794	322,397
1911	701,618	42,723	744,341	372,171
1912	671,535	89,740	761,275	380,637
1913	685,752	31,926	517,678	258,839
1914	721,900	204,360	926,260	463,130
1915	546,600	174,260	720,260	360,130
1916	685,620	61,524	747,144	373,572
1917	670,580	61,805	732,385	366,192
1918	636,920	79,870	716,790	358,395
1919	639,250	103,530	742,780	371,390
1920	688,640	71,179	759,819	379,910
1921	717,850	84,556	802,406	401,203
1922	560,310	25,700	586,010	293,005
1923	701,890	390,404	1,092,294	546,147
1924	671,000	54,611	725,611	362,805
1925	427,900	89,556	517,456	258,728
1926	547,540	84,970	632,510	316,255
1927	600,700	204,774	805,474	402,737
1928	569,430	115,235	684,665	342,333
1929	628,420	131,644	760,064	380,032
1930	521,200	119,383	640,583	320,292
1931	342,349	58,801	401,150	200,575
1932	518,097	22,834	540,931	270,466
1933	448,698	67,234	515,932	257,966
1934	310,238	29,822	340,060	170,030
1935	515,306	69,025	584,331	292,166
1936	627,419	66,756	694,175	347,088
1937	416,220	72,479	488,699	244,350
1938	554,850	64,070	618,920	309,460
Average	573,964	96,416	670,380	335,190

670,380 acre feet is between 52% and 54% of the average yearly water supply of the basin in Colorado--1,240,000 to 1,290,000 acre feet--Kansas Exhibit 63.

CORRECTED
ARKANSAS RIVER FLOW AT CANON CITY
1908-1938

Year	Arkansas River at Canon City Colo. Ex. 204 1	Diversions around Canon City Gage 2	Trans-mountain Water 3	Corrected Arkansas River at Canon City 1+2-3 4
1908	341,271	55,000		396,271
1909	658,970	43,000		701,970
1910	497,408	70,000		567,408
1911	638,618	63,000		701,618
1912	619,535	52,000		671,535
1913	428,752	57,000		485,752
1914	659,900	62,000		721,900
1915	491,000	57,000	2,000	546,000
1916	626,200	62,000	2,580	689,620
1917	615,900	57,000	2,320	670,580
1918	588,200	51,000	2,280	636,920
1919	582,100	59,000	1,850	639,250
1920	628,300	62,000	1,660	688,640
1921	661,700	58,000	1,850	717,850
1922	512,900	49,000	1,590	560,310
1923	651,100	53,000	2,210	701,890
1924	605,000	69,000	3,000	671,000
1925	365,900	65,000	3,000	427,900
1926	497,500	55,000	4,960	547,540
1927	550,100	59,000	8,400	600,700
1928	511,300	65,000	6,870	569,430
1929	584,300	53,000	8,880	628,420
1930	460,600	66,940	6,340	521,200
1931	270,200	76,757	4,608	342,349
1932	454,800	75,004	11,707	518,097
1933	389,200	70,006	10,508	448,698
1934	245,750	72,588	8,100	310,238
1935	468,770	76,636	30,100	515,306
1936	589,200	77,407	39,188	627,419
1937	382,500	76,233	42,513	416,220
1938	535,810	78,668	59,628	554,850.

Diversions around the gage at Canon City, 1908-1930, from Kansas Exhibit #20.
From 1931-1938 computed from Daily Reports Arkansas Valley Ditch Association.

Trans-mountain diversions 1915-1930 from Kansas Exhibit #25. From 1931-1938, Colorado Exhibit #194.

No. 5 Original

IN THE

Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

REPLY BRIEF FOR COMPLAINANT, THE STATE OF COLORADO.

GAIL L. IRELAND,
Attorney General
of the State of Colorado,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant,
Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,
Special Counsel for Complainant.

PEERLESS PRINTING COMPANY, DENVER

INDEX

THE ISSUES PRESENTED BY THE DEFENDANTS' BRIEF 1

ON THE QUESTION OF EQUITABLE APPORTIONMENT THE RULE OF RES ADJUDICATA APPLIES UNLESS KANSAS SUSTAINS THE BURDEN OF SHOWING THAT SINCE 1907 IT HAS SUFFERED INJURY TO ITS SUBSTANTIAL INTERESTS AS A RESULT OF MATERIALLY INCREASED STREAM DEPLETIONS IN COLORADO..... 3

(a) The Rule of Res Adjudicata..... 3

(b) The Controlling Issue in the Former Case Was Equitable Apportionment 5

(c) The Rights of The Western Kansas Counties For Irrigation Water Were At Issue In, and are Concluded By, The 1907 Decision..... 7

(d) The Kansas Claim of a Right to Receive A Fixed Percentage of Index Flows Is Contrary to the Former Decision 8

(e) The Presence of The Finney County Water Users' Association as A Defendant Does Not Affect the Applicability of The Rule of Res Adjudicata 11

EQUITABLE APPORTIONMENT 12

(a) The Kansas Theory of Equity of Need Constitutes an Indirect Attack Upon The 1907 Decision 12

(b) Need for Water Is But One of Several Factors Which Must Be Considered In Applying The Rule of Equitable Apportionment 14

(c) The Application of The Principle Of Equitable Apportionment Does Not Require any Precise Division of Water 19

INDEX—(Continued)

PAGE

KANSAS HAS FAILED TO SUSTAIN THE BURDEN OF PROVING THAT THERE HAS BEEN A MATERIAL INCREASE IN THE DEPLETION OF THE STREAM BY COLORADO..... 22

(a) The Theory That An Increase In Irrigated Acreage Indicates An Increase In Permanent Depletion of The Water Supply is Fallacious 22

(b) The Meeker "Analytical Study" Is Based Upon Estimates and Assumptions, Is Thoroughly Discredited, and Does Not Constitute the Clear and Convincing Evidence Necessary To Justify a Decree Against a State..... 23

(c) The Attempted Showing that Colorado Reservoir Storage Has Deprived Kansas of Usable State Line Flows is Inconclusive..... 26

(d) The Variability of The State Line Flow Does Not Prove Any Increase in Stream Flow Depletion 27

KANSAS HAS FAILED TO SUSTAIN THE BURDEN OF PROVING THAT THERE HAS BEEN AN INJURY TO ITS SUBSTANTIAL INTERESTS BY REASON OF ANY INCREASE IN STREAM FLOW DEPLETION BY COLORADO SINCE THE FORMER DECISION..... 29

(a) An Increase by Colorado in Stream Depletion Does Not Require An Affirmative Decree Of Equitable Apportionment Unless There Is A Resulting Injury to The Substantial Interests of Kansas 29

(b) The Kansas Showing of Irrigable Land Which Might Have Been Irrigated Except for Stream Depletion by Colorado is Not A Showing of Injury to Its Substantial Interests..... 29

INDEX—(Continued)

PAGE

THE MASTER'S RECOMMENDATIONS AND THE MODIFICATIONS REQUESTED BY KANSAS ARE INEQUITABLE AND UNFAIR TO COLORADO 31

(a) Kansas Agrees with Colorado That The Master's Recommendations Are Ambiguous and Uncertain 31

(b) The Changes Requested by Kansas..... 32

(c) The Master Did Not Recommend That Kansas Is Entitled to 30.87% of the Index Flows.... 32

(d) Any Decree Awarding to Kansas a Percentage of the Index Flows and Having the Effect of Impairing Early Colorado Priorities Would Violate Colorado's Right to an Equitable Apportionment of Stream Flow 33

(e) The Kansas Proposals Would Destroy The Irrigation Development of the Arkansas Valley In Colorado Below Canon City..... 37

(f) A Common Sense Approach to a Decree of Equitable Apportionment Requires That Before Any Such Decree Be Entered A Careful Analysis Be Made to Determine Its Probable Effect 44

(g) Administration to Protect Colorado is Just As Important and Necessary As Administration To Protect Kansas 46

IRRIGATION IN KANSAS 47

THE 1916 SETTLEMENT 49

CADDOA RESERVOIR 51

MISCELLANEOUS MATTERS APPEARING IN THE DEFENDANTS' BRIEF WHICH ARE DISPUTED BY COLORADO 56

INDEX—(Continued)

PAGE

MEMORANDUM OF THE UNITED STATES..... 59

CONCLUSION 60

APPENDIX C

A CRITICAL ANALYSIS OF THE EVIDENCE OF THE KANSAS WITNESS MEEKER PURPORTING TO SHOW STREAM DEPLETION BY COLORADO 63

TABLE OF AUTHORITIES

CASES:

Arizona v. California, 283 U. S. 423..... 20

Arizona v. California, 298 U. S. 558..... 20

Burley Irrigation District v. Ickes, 116 Fed. (2d) 529, 535 46

Chicot County Drainage District v. Baxter State Bank, 308 U. S. 371, 378 4

Clark v. Allaman, 71 Kan. 206 5

Connecticut v. Massachusetts, 282 U. S. 660, 670.....14, 20

Frizell v. Bindley, 144 Kan. 84 47

Grubb v. Public Utilities Commission of Ohio, 281 U. S. 470, 479 3

Kansas v. Colorado, 206 U. S. 46.....1, 5, 9, 18, 20

Kansas v. Colorado, 185 U. S. 125..... 20

Missouri v. Illinois, 180 U. S. 208; 200 U. S. 496..... 20

Nebraska v. Wyoming and Colorado, United States Intervener 15, 61

New Jersey v. New York, 283 U. S. 336..... 20

New York v. New Jersey, 249 U. S. 202; 256 U. S. 496. 20

INDEX—(Continued)

	PAGE
North Dakota v. Minnesota, 256 U. S. 220	20
South Carolina v. Georgia, 93 U. S. 4	20
South Dakota v. Minnesota, 263 U. S. 365	20
Stoll v. Gottlieb, 305 U. S. 165, 172	3
Tennessee v. Arkansas, 249 U. S. 588	20
Treines v. Sunshine Mining Co., 308 U. S. 66, 78	3
United States v. Appalachian Electric Power Co., 311 U. S. 377, 423	47
United States v. California and Oregon Land Co., 192 U. S. 355	3
Washington v. Oregon, 297 U. S. 517	20
Werlein v. New Orleans, 177 U. S. 390	3
Wisconsin v. Illinois, 278 U. S. 367; 281 U. S. 179	20
Wyoming v. Colorado, 259 U. S. 468	11
Wyoming v. Colorado, 286 U. S. 494, 509	11
Wyoming v. Colorado, 259 U. S. 419	20
Wyoming v. Colorado, 298 U. S. 573; 309 U. S. 572	20

TEXTS AND MISCELLANEOUS:

"Is There a New Era in the Law of Interstate Waters," 5 Southern California Law Review 25, 34-35, by Ernest Carman	14
"Fifty Years of Water Law," 50 Harvard Law Review 252, 299-300, by Wiel	17

IN THE

Supreme Court of the United States

OCTOBER TERM, 1942

No. 5 Original

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

REPLY BRIEF FOR COMPLAINANT, THE STATE OF COLORADO.

THE ISSUES PRESENTED BY THE DEFENDANTS' BRIEF.

At the beginning of this reply brief, it will be well for us to evaluate the issues between the parties as they now appear. Considering only fundamental matters, the situation may be summarized thus:

1. Defendants do not contest the right of the complainant to the injunction against the further prosecution of the Finney County cases.

2. Defendants do not accept the decision in *Kansas v. Colorado* as a final determination of the rights of the western Kansas counties to water for irrigation purposes. On the other hand the complainant contends that such decision is *res adjudicata* on the issues raised by the defendants' cross-bills.

3. Upon the basis of the so-called "analytical study"

of witness Meeker and "stabilized consumptive use" theory of witness Knapp, defendants urge that there has been a material increase by Colorado in the depletion of the flow of the Arkansas since the former decision. Colorado says that there has been no increased depletion of the stream flow by it since 1907 because the record shows (a) a decline in consumptive uses in Colorado (ditch diversions less returns to the river), (b) an increase in divertible and usable state line flows since 1907, (c) an increase in Kansas ditch diversions since 1907, (d) an increase in Kansas irrigated acreage.

4. Kansas asserts that it has been injured because there are within its borders irrigable lands, which would have been irrigated except for the alleged stream depletions in Colorado. Colorado contends that Kansas has not been injured because (a) Kansas population has increased, (b) Kansas agricultural production has increased, (c) Kansas irrigated acreage has increased, (d) the prosperity and general welfare of the great body of the valley in Kansas has greatly improved since the 1907 decision.

5. Kansas argues for a decree which will both define legal rights and provide for adequate administration so as to assure Kansas a definite amount of water each year. Colorado says that it cannot guarantee water production and that in any definition of its legal rights Kansas should not be given a greater or more regular supply than existed in a condition of nature. Colorado says further that the function of the Court is limited to the definition of legal rights and does not encompass the field of administration.

6. Kansas denies that the 1916 Settlement has any place in determining the equitable apportionment of the stream flow and entirely ignores the 1933 Stipulation. Colorado says that both these agreements were made in good faith and should be given great, if not controlling, weight in determining the amount of water to which Kansas is entitled.

7. Kansas treats of Caddoa reservoir as a Colorado project which constitutes a threat of further stream deple-

tion. Colorado says that Caddoa is a Federal project which was sponsored by both states and which should be used for the conservation storage of water for the benefit of both states and for aid in the settlement of this prolonged controversy.

In contrast to these differences between the parties there is one thing in which they are in agreement. They all say that the recommendations of the Special Master as to the apportionment of the water between the States are uncertain, ambiguous and confusing and must not be adopted by this Court.

ON THE QUESTION OF EQUITABLE APPORTIONMENT THE RULE OF RES ADJUDICATA APPLIES UNLESS KANSAS SUSTAINS THE BURDEN OF SHOWING THAT SINCE 1907 IT HAS SUFFERED INJURY TO ITS SUBSTANTIAL INTERESTS AS A RESULT OF MATERIALLY INCREASED STREAM DEPLETIONS IN COLORADO.

(a) The Rule of Res Adjudicata.[1]

The law in relation to the effect of a judgment between the same parties and involving the same subject matter is well known *(Werlein v. New Orleans,* 177 U. S. 390). One trial of an issue is enough *(Treines v. Sunshine Mining Co.,* 308 U. S. 66, 78). A party is not at liberty to prosecute a claim by piecemeal, as by presenting a part only of the available grounds and reserving others for another suit, if failing in the first *(Grubb v. Public Utilities Commission of Ohio,* 281 U. S. 470, 479). It was well said in *Stoll v. Gottlieb,* 305 U. S. 165, 172:

> "Courts to determine the rights of parties are an integral part of our system of government. It is just as important that there should be a place to end as that there should be a place to begin litigation. • • • There is no reason to expect that the second decision will be more satisfactory than the first."

Since the rule applies against the United States in actions brought by it *(U. S. v. California & Oregon Land*

[1]Colorado has pleaded *res adjudicata*—see Bill of Complaint, pp. 21-22, Reply p. 12.

Co., 192 U. S. 355), there is no reason why it should not apply in actions between states.

The rule is that a judgment upon the merits in one suit is *res adjudicata* in another where the parties and subject-matter are the same, not only as respects matters actually presented to sustain or defeat the right asserted but also as respects any other available matter which might have been presented to that end (*Grubb v. Public Utilities Commission of Ohio, supra*, p. 479; *Chicot County Drainage District v. Baxter State Bank*, 308 U. S. 371, 378).

All the reasons for the rule of *res adjudicata* are magnified a hundred fold in a situation such as is presented in this case. Here we have a social-economic problem which vitally affects the more than 500,000 people living in the 46,000 square miles constituting the Arkansas river basin in Colorado and Kansas.[2] Even in a country as large as the United States, the stability of such a civilization is of importance to the national welfare.

For thirty-five years the farmers, who through their enterprise, ingenuity and energy have converted into a prosperous agricultural community a section classified as a desert in the days of the famous Santa Fe Trail, have invested their money, tilled their fields and established their homes with the understanding that in 1907 this Court, as the sole arbiter, had ruled upon the rights of the states in connection with the use of Arkansas river water. The faith of the people should not be destroyed by a present reexamination or reconsideration of the issues then determined. This requires that in the case at bar the litigants and the Court should start from the premise that by the 1907 decision this Court held that Colorado was not exceeding its equitable share of use of Arkansas river water and that it could increase that use until by a material increase in stream depletion to the injury of the substan-

[2]The 1940 census shows a population of 504,000 in the counties of the two states crossed by the main channel of the river. If counties within the basin but not crossed by the main river were included, the population figures would be considerably higher.

tial interests of Kansas, it destroyed the equitable apportionment of benefits then existing.

(b) The Controlling Issue in the Former Case Was Equitable Apportionment.

Kansas argues (Brief, p. 45) that the equitable division of the water supply of the Arkansas river between Colorado and Kansas is in this case before the Court for the first time. We deny the validity of that contention and say that in its former decision this Court held not only that Colorado was not by its uses taking more than its share of Arkansas river water but also that Colorado could increase its uses until there resulted an injury to the substantial interests of Kansas.

The difference between the two positions is that Kansas urges that there is no equitable apportionment unless there is a decree dividing the water supply. Colorado says that in the application of the rule of equitable apportionment it is never necessary or proper for the Court to make a decree dividing the water supply, a decree which imposes a restriction or limitation upon the quasi-sovereignty of the upper state, unless the upper state has, by the taking of more than its share, inflicted an injury of serious magniture on a lower state.

In the opinion written by Justice Brewer in *Kansas v. Colorado*, this Court for the first time expounded the principle of equitable apportionment as the test in determing the rights of states in controversies over the use of the waters of an interstate stream. But it did not stop there. It applied the principle to the facts then before it. After referring to a decision of the Kansas Supreme Court (*Clark v. Allaman*, 71 Kan. 206, 80 Pac. 571) wherein the rule of reasonable use was given effect as between individual riparian proprietors, this Court said (206 U. S. 104-105):

> "As Kansas thus recognizes the right of appropriating the waters of a stream for the purposes of irrigation, subject to the condition of an equitable di-

vision between the riparian proprietors, she cannot complain if the same rule is administered between herself and a sister state."

Following that statement the Court entered upon a discussion of the facts relative to the Arkansas basin and the use of water therein and concluded its review of that evidence with this (206 U. S. 113-114):

> "It cannot be denied, in view of all the testimony (for that which we have quoted is but a sample of much more bearing upon the question), that the diminution of the flow of water in the river by the irrigation of Colorado has worked some detriment to the southwestern part of Kansas, and yet, *when we compare the amount of this detriment with the great benefit which has obviously resulted to the counties in Colorado*,[3] it would seem that equality of right and equity between the two states forbids any interference with the present withdrawal of water in Colorado for purposes of irrigation."

The direction for a decree is in this language (206 U. S. 117):

> "The decree which, therefore, will be entered, will be one dismissing the petition of the intervener, without prejudice to the rights of the United States to take such action as it shall deem necessary to preserve or improve the navigability of the Arkansas river. The decree will also dismiss the bill of the State of Kansas as against all the defendants, without prejudice to the right of the plaintiff to institute new proceedings whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river."

---

[3]All italics in this brief are supplied by the author.

The effect of such a decree is not obscure. The Court says, plainly and unmistakably, that Colorado has not by its water uses taken more than its share of the flow of the stream than it is entitled to take under the principle of equitable apportionment. *Since Colorado uses were within the share of the state, there was no reason to make any precise definition of rights.* It is particularly noteworthy that the Court did not forbid further irrigation expansion in Colorado. Rather it recognized that such would take place and accordingly permitted Kansas to sue again when, as a result of such additional uses, the equitable apportionment between the two states was destroyed. As a warning perhaps to Colorado and as a guide to Kansas, the Court expressly stated the conditions under which Kansas might again sue for relief. These were (a) a material increase in stream depletions by Colorado and (b) a resulting injury to the substantial interests of Kansas. Kansas has not sustained the burden of satisfying these conditions. Hence, the 1907 decision is *res adjudicata.*

(c) The Rights of the Western Kansas Counties For Irrigation Water Were at Issue In, And Are Concluded By, the 1907 Decision.

The theme song of the defendants' brief is that this case involves, from the Kansas standpoint, only the western counties of that state wherein irrigation is practiced from the surface flows of the river. An attempt seems to be made to leave the impression that these irrigation uses were not presented in the former litigation and were not determined by the former decision.

The reason for the Kansas position is apparent. In the former suit Kansas alleged and sought to prove injury to the entire basin within its borders. It failed to make out a case. It hopes that by confining this suit to the small western portion of the basin in Kansas, it can obtain a decree which, through the curtailment of existing Colorado uses, will result in additional water being made available for irrigation in western Kansas. The growth and prosperity of "the great body of the valley" in Kansas has

been such that if Kansas was not entitled to relief in 1907, it certainly is not entitled to relief now.

Kansas itself injected into the other case the use of water for irrigation in its western counties. To sustain its allegations of injuries, it averred among other things that (206 U. S. 52) "the water for irrigation ditches in the western part of Kansas has been entirely cut off" and "the irrigation ditches are left dry and the lands uncultivated." The Court in its opinion referred to the irrigation ditches in western Kansas, saying (206 U. S. 113-114):

> "At one time there were some irrigating ditches in these western counties, which promised to be valuable in supplying water, and thus increasing the productiveness of the lands in the vicinity of the stream, and *it is true that those ditches have ceased to be of much value,* the flow in them having largely diminished."

And that

> " • • • the diminution of the flow of water in the river by the irrigation of Colorado has worked some detriment to the southwestern part of Kansas • • • ."

After finding such to be the facts, the Court went on to say (206 U. S. 114):

> " • • • and yet when we compare the amount of this detriment with the great benefit which has obviously resulted in the counties in Colorado, it would seem that equality of right and equity between the two states forbids any interference with the present withdrawal of water in Colorado for purposes of irrigation."

Thus the irrefutable records disclose that in the former case the irrigation uses in the western Kansas counties were presented to the Court and taken into consideration by the Court in making its decision. *There is no claim of any worsening in condition since the former decision.* In-

deed the record shows that agricultural production in general, and irrigated acreages in particular, have increased. Since this Court held that the Colorado uses did not in 1907 exceed the share of the state under the principle of equitable apportionment, it would seem to be established beyond cavil that the present Colorado uses are within the share of the state. How can it be said that any restriction is now required on the Colorado uses because of irrigation conditions in western Kansas when those conditions are greatly improved?

(d) The Kansas Claim of a Right to Receive a Fixed Percentage of Index Flows is Contrary to the Former Decision.

Kansas by its exceptions to the Report of the Master and the arguments advanced in its brief contends for a decree which will award to it a fixed percentage of certain index flows. Specifically it asks for 30.87% of the combined flow of the stream at the gaging stations located at Canon City and at the mouth of the Purgatoire. Any award to Kansas of such an amount of water will run contrary to the 1907 decision, and will violate the rule of *res adjudicata*.

In its opinion in *Kansas v. Colorado* the Court pointed out that the Colorado decrees exceeded in amount the flow of the river at Canon City. We quote from 206 U. S. 106-107:

> "The amount of water authorized to be taken by the (Colorado) ditches from the river is, as alleged in the bill, 4,200 cubic feet, and from its affluents and tributaries 4,300 feet. * * * The average flow of the river as it comes out of the Royal Gorge at Canon City is, as shown by official measurements for a series of years 750 cubic feet. *So that it appears that the irrigating ditches are authorized to take from the Arkansas river much more water than passes in the channel into the valley.* It is not clear what surplus water, if any, comes out of the tributaries. There are some twenty-five of them, the average flow from four of which into the Arkansas is 313 cubic feet. Aside

from this surplus water some may be returned through overflow of the ditches or from seepage. What either of these amounts may be is not disclosed."

Thus in 1907 the Court recognized that Colorado ditch priorities from the main stream amounted to at least 4,200 c.f.s.[4] while the flow of the river at Canon City was 750 c.f.s. and still it held that Colorado had not exceeded its equitable share of river flow.

Now Kansas asks that 30.87% of the Canon City flow be required to pass to the state line for delivery to it. A decree which would have such effect would run directly contrary to the 1907 decision. *Every drop of the Canon City flow was required by the Colorado priorities in 1907.* It takes no great mathematical ability to figure that the satisfaction of decrees amounting, as alleged in the Kansas bill to 4,200 c.f.s. but actually amounting to over 6,000 c.f.s.,[5] requires the use of a flow of 750 c.f.s. many times. The only result which can be gained from the application of the Court's opinion to this situation is that the Court then considered that Colorado was entitled to divert and use the entire Canon City flow.

In 1907 the Court did not require Colorado to pass any of the Canon City flow to Kansas. Now, thirty-five years later, after irrigation conditions in western Kansas have improved and after Colorado users have invested their money and carried on their enterprises upon the basis that they were not required to pass any of the Canon City flow to Kansas, it would be a violation of the rule of *res adjudicata* to award to Kansas any fixed percent of the Canon City flow.

Kansas witness Meeker finally admitted notwithstanding his effort to show increased depletion since 1907 that "I think that the direct river flow was pretty well depleted in 1905, and that the depletion since that time has come from both winter flow, and considerable flood water, and some direct flow" (Tr. p. 2095). And that he meant that

[4]Cubic feet per second of time.
[5]See Colorado Opening Brief, p. 5.

the dependable flow or the normal seasonal flow occurring during the irrigation season, which is chiefly mountain run-off, was being largely consumed in Colorado by 1905 (Tr. p. 2173).

(c) The Presence of The Finney County Water Users' Association as A Defendant Does Not Affect The Applicability of The Rule of Res Adjudicata.

Colorado joined The Finney County Water Users' Association as a defendant because the purpose of the complaint was primarily to secure an injunction against the further prosecution of the two cases brought by that Association against individual Colorado water users in the United States District Court for the District of Colorado. However, the presence of this private water user as a defendant has no effect on the applicability of the rule of *res adjudicata* so far as the issues raised by the cross-bills are concerned.

In the former case Kansas joined with Colorado as defendants certain private Colorado water users who appeared and presented evidence and argument. This Court said with reference to such private interests (206 U. S. 85):

> "While several of the defendant corporations have answered, it is unnecessary to specially consider their defenses, for, if the case against Colorado fails, it fails also against them."

In the Laramie river case the Court expressed the idea with this language (*Wyoming v. Colorado*, 259 U. S. 468):

> "Thus the interests of the state are indissolubly linked with the rights of the appropriators."

In its second decision in the Laramie river controversy the Court said (*Wyoming v. Colorado*, 286 U. S. 494, 508-509):

> "But it is said that water claims other than the tunnel appropriation could not be, and were not, affected by the decree, because the claimants were not

parties to the suit or represented therein. In this the nature of the suit is misconceived. It was one between states, each acting as a quasi-sovereign and representative of the interests and rights of her people in a controversy with the other. Counsel for Colorado insisted in their brief in that suit that the controversy was 'not between private parties' but 'between the two sovereignties of Wyoming and Colorado'; and this court in its opinion assented to that view, but observed that the controversy was one of immediate and deep concern to both states and that the interests of each were indissolubly linked with those of her appropriators. * * * Decisions in other cases also warrant the conclusion that the water claimants in Colorado, and those in Wyoming, were represented by their respective states and are bound by the decree."

Hence the Finney County Association was represented by the state of Kansas in the former suit and is bound by the decision therein.

The appropriation claimed for the Farmers ditch of the Association is under a date of 1880 (Kansas Answer, p. 34). In fact the dates claimed for all the Kansas ditches are within the period 1879 to 1892 (Kansas Answer, pp. 33-34). There is no claim of the initiation of any new rights since 1907 and there is no claim of any worsening of conditions under any of the ditches since 1907. *Hence whatever rights any of these ditches had were before the Court in the former case and are forever concluded by that decision.*

EQUITABLE APPORTIONMENT.

(a) The Kansas Theory of Equity of Need Constitutes an Indirect Attack Upon the 1907 Decision.

On pages 52 to 61 of their brief the defendants set forth their theory that the primary factor in the determination of equitable apportionment is equity of need. Their argument is that there is a similarity of conditions in the western Kansas and eastern Colorado counties along the

Arkansas river and that, since the need of water for irrigation in Kansas is allegedly as great as the need for water for irrigation in Colorado, they have an equal need of water for irrigation.

There is no assertion that the conditions in Kansas are any different now than they were at the time of the former suit. Consequently, whatever may have been the need of the western Kansas counties for water for irrigation purposes it was a factor which was presented to, and determined by, the 1907 decision of this Court. Under the rule of *res adjudicata,* which we have heretofore discussed, that decision is conclusive. The assertion of the theory of equity of need is an attempt to secure a relitigation of the issues decided by this Court thirty-six years ago.

On page 61 of their brief the defendants directly attack the finding made by this Court in its 1907 decision that (206 U. S. 109):

> " • • • reliance upon mere cultivation of the soil would not have anything like the effect in Colorado that it has had in Kansas, and that the barrenness which characterized portions of the territory in Colorado would have continued for an indefinite time unless relieved by irrigation."

This criticism of the former decision is unjustified. The only basis for it is that certain Kansas evidence indicates that crop yields on unirrigated lands in certain Colorado and Kansas counties in the Arkansas river basin are quite similar. It would seem that the entire argument for Kansas is answered by the statement made in their brief on page 60:

> "It is not maintained that these comparisons indicate that dry land farming in either area can be classified on the basis of successful agriculture • • •."

Thus Kansas bases its contention upon a form of agriculture which it implies is not successful. There can be no question that irrigated agriculture along the Arkansas river basin in Colorado is successful. Likewise, there is no

question that agriculture in the western Kansas counties is successful without irrigation. Colorado Exhibit 68 shows that in the period 1921 to 1930 the five western Kansas counties on the channel of the Arkansas river had an average acreage in field crops of 910,342 acres, and that the average value of the field crops was $12,285,400 (Colo. Ex. 68, Tr. p. 3003, App. B, p. 15). Of these 910,342 acres of field crops there were in 1929 only 60,897 acres irrigated. It is thus obvious that *irrigation plays but a minor part in the agriculture of these five Kansas counties.* They have since the 1907 decision grown in population and increased their production. Whatever their need for water may be, it was determined by the 1907 decision.

(b) Need for Water is But One of Several Factors which Must Be Considered in Applying the Rule of Equitable Apportionment.

Kansas presents its theory of equity of need as though the need for water was the sole consideration in arriving at an equitable apportionment of the flow of an interstate stream. Most obviously the need for water is a matter which merits consideration, but there are other matters just as important.

It has been said that equitable apportionment is a nebulous ideal that yields but little to precedent and still less to rigid formula and always can be fitted to the needs of the times and to the general welfare in any particular case.[6]

In *Connecticut v. Massachusetts,* 282 U. S. 660, 670, this Court, after remarking that equity of right between states does not require an equal division of the waters of an interstate stream among the states through which it flows, said that in determining equitable apportionment the principles of right and equity shall be applied having regard to the "equal level or plane on which all the states stand, in point of power and rights, under our constitutional system."

[6] See Article by Ernest Carman entitled, "Is There a New Era in the Law of Interstate Waters," 5 Southern California Law Review 25, 34-35.

Without quibbling over a formula, let us briefly examine the traditions and practices in the Arkansas river basin with the thought of arriving at certain basic facts which must be recognized to effectuate an equitable apportionment between Colorado and Kansas.

At the outset it should be noted that the basic conflict is between water uses in the upper and lower levels of the stream. Such a conflict is not new in the West. It has arisen often between private individuals. It was because of this conflict that the Colorado River Compact was made prior to the extensive developments on that stream. It is the basic consideration of not only this case but also the North Platte river case (*Nebraska v. Wyoming and Colorado, United States Intervener,* Original No. 7, October 1943 Term). Mention of the pending North Platte case is made because it would seem that if in this case the Colorado contentions of no injury and *res adjudicata* are not to be sustained and if the Court is to add to the body of the federal common law pertaining to interstate streams, the treatment of the upper and lower levels of these stream systems should be based on parallel and not upon divergent principles.

The streams of the Mississippi river basin rising in the eastern portion of the Rocky Mountains after leaving the mountains flow first through a section where the rainfall is very substantially less than in the high mountains. In this belt rainfall tends to decrease for 100 to 150 miles easterly from the mountains, then it again increases until at points 250 to 350 miles from the mountains there is unquestionably adequate precipitation to sustain successful agriculture. The need for water to grow crops resulted in the construction of irrigation ditches in the plains section just east of the mountains. The success of the first enterprises attracted new settlers and considerable amounts of capital. Large canals were built and storage reservoirs were provided to supplement the late summer supplies. Farmers living in this area realized their utter dependence upon water. They readily invested large sums and paid

substantial maintenance and operation charges in order to secure water for their crops. Further east in the area where the precipitation was greater irrigation enterprises such as the Garden City group of ditches in Kansas were planned and to some extent constructed in the 1880's. However, in this area the farmers look upon the water necessary for their crops as a bounty which they should receive from nature. In many, perhaps in most years, rainfall is sufficient to produce a crop. Hence the farmers in this area were and are reluctant to invest money in, or to pay maintenance and operation charges on, irrigation projects. Water was something which they should receive free, not something for which they should pay. The history of the Kansas irrigation enterprises has been duplicated in other sections. We have recounted in our review of the evidence in Appendix A, pp. 108-109, how the Kansas ditches became bankrupt and went into receivership, how the farmers refused to buy water from the receivers and how the farmers refused to pay operation and maintenance charges on a Bureau of Reclamation pumping project. The result has been that in the upper area where the farmers need irrigation water every year, the irrigation enterprises have been constantly improved so that the most efficient use of the supply of water may be obtained. In the lower levels the farmers even to this day look upon irrigation as merely a form of insurance against crop failure at times of deficient rainfall.

The bearing which this situation has upon an equitable apportionment between the two levels represented by the states of Colorado and Kansas is important. The use of water to irrigate crops has unquestioned social value. The history of the region shows that in Colorado the necessity for, and value of, the use of water for irrigation has always been of preeminent importance. In Kansas it has had a less important place. In other words, *the relative social value of the use of water for irrigation in Colorado has always been greater than it has in Kansas.*

Another factor is that the irrigated acreage in Colo-

rado begins near the headwaters and the irrigated acreage in Kansas begins several hundred miles downstream. No knowledge of engineering is necessary to understand the desirability of utilizing stream flows as near the headwaters as is possible. As is pointed out in our former brief and Appendix A thereto, the Arkansas river, in common with similar streams, loses water by evaporation, transpiration and percolation as it crosses the Great Plains. To take the water out of the stream before it is subjected to these losses and to use it in the western portions of the Great Plains is to secure the maximum of benefit from this natural resource. Water which is passed on to Kansas is subject to conveyance losses from the causes mentioned. In addition there is the ever present likelihood that conditions of natural precipitation may be such in Kansas that when any given amount of water arrives there, it either cannot or will not be used. The needs of the crops are in many years satisfied by rain and require no water from the river. At such times the flow is permitted to pass unused out of the irrigated portion of the basin.

The use of this natural resource to obtain the greatest benefit therefrom can only result from a use at a point as near the headwater stretches as is possible. The irrigation requirements in Kansas can well be met through pumping projects. Indeed, these are recommended by the chief witness for Kansas (See App. A, pp. 104-105). When irrigation water is not an ever present necessity but merely an insurance against crop failure in times of natural deficiency, the use of ground water by means of pumps is to be preferred to the use of surface water through the means of ditches. The use of pumps imposes no burden upon the upstream ditches to forego the use of water which may not be needed when it has reached the downstream area.

Perhaps the most important factor in determining rights as between the upper and lower levels of the stream is priority of use. This has been long recognized by eminent authorities. Wiel in discussing the opposing rights of the upper and lower levels of a stream in his article "Fifty

Years of Water Law," 50 Harvard Law Review 252, 299-300 says:

> "The longer the time, the more weight priority must doubtless have in determining what is reasonable use; furthermore, water law has been disclosing new situations during these fifty years where it is necessary to give priority special prominence simply because other factors, although they may exist, fail to get into issue."

This question of priority of use runs directly contrary to the Kansas theory of equity of need.

In Colorado two years after the decision in *Kansas v. Colorado* there was an irrigated acreage in the Arkansas river basin of 464,236 acres and in 1939, 469,168 acres. In Kansas the figures for the same years in the five western counties where irrigation was practiced from the surface flows were 34,879 and 64,104 respectively. Colorado increased approximately 5,000 acres and Kansas approximately 30,000 acres. Kansas now says that it should receive water for the irrigation of additional land. We have shown elsewhere in this brief that to award to Kansas water for the irrigation of additional land is to impose on Colorado a curtailment of use and the resulting reduction in acreage. In support of their theory of equity of need Kansas says that there are 414,000 acres of irrigable land in the western portion of the basin in Kansas. Colorado Exhibit 196 (App. B, p. 50), shows that the United States Census Bureau reports that the irrigable area in enterprises in Colorado in 1940 was 672,627 acres and in Kansas was 127,950 acres. On their own theory, justified first on the basis of need for water, and second on the existence of land upon which water can be used, the rights of Kansas fall far below those of Colorado. *Colorado not only has greater need for the water but also has more land in existing enterprises upon which it can be used.*

(c) The Application of the Principle of Equitable Apportionment Does Not Require Any Precise Division of Water.

The Kansas argument is that since the two states have come to the Supreme Court of the United States with their dispute over the waters of this interstate stream, the Court will enter a decree of equitable apportionment. They assume the need for such a decree and they bluntly ask the Court to provide with "definiteness" for "adequate administration" (Kansas Brief, p. 45). The Court is a judicial not a legislative nor an administrative body. The Court may not write a compact for the states. This was pointed out in the 1907 decision when the Court, after remarking that Colorado could not be upheld in appropriating the entire flow of the river upon the ground that it was giving to Kansas something of equal value, said (206 U. S. 100):

> "That would be equivalent to this Court's making a contract between the two States, and that it is not authorized to do."

We pointed out in our opening brief that an effective decree of equitable apportionment requires the imposition upon the upstream state of some restriction or limitation. Kansas recognizes the validity of this argument. In that section of its brief, beginning on page 140 and headed "Why Enjoin Kansas?", the contention is made that the provisions of paragraph 9 of the Conclusions of Law and Paragraph 8 of the Recommended Decree should be modified by the elimination of any reference to Kansas. These two paragraphs purport to enjoin both Colorado and Kansas, and their officials and agents, from diverting and using water in excess of the amounts awarded to the states respectively. In support of its contention Kansas says (Brief, p. 141):

> "Water runs down hill, and Kansas never has or never will be able to use water in excess of any amount decreed by the Court as against the rights of Colorado. The shoe is on the other foot."

Colorado is a State of the Union and is on an equality with all other states. Any restriction or limitation upon its water uses is a restriction or limitation upon its quasi-sovereignty and, under the many decisions which we cited in our opening brief, will not be imposed in the absence of a showing by clear and convincing evidence of an existing or presently threatened injury of serious magnitude.

We direct attention to the fact that in the fourteen cases between states involving interstate waters this Court has granted relief in but three of them.[1]

In the Laramie river case the Court enjoined a transmountain diversion proposed by Colorado (*Wyoming v. Colorado*, 259 U. S. 419). In the Great Lakes Drainage case the Court limited diversions from Lake Michigan proposed by the Sanitary District of Chicago for the purpose of sewage disposal (*Wisconsin v. Illinois*, 278 U. S. 367, 281 U. S. 179). In the Delaware river case the Court enjoined transmountain diversions for domestic purposes in excess of stated amounts (*New Jersey v. New York*, 283 U. S. 336). In each case the action taken was to restrain a use which would take water away from the stream or lake and the justification for the action was the necessity to protect existing uses. In the Laramie river case the prior and existing irrigation uses were protected. In the Great Lakes Drainage case the purpose was the restoration of the navigable capacity of the Great Lakes to the former level. In the Delaware river case the safeguarding of the

---

[1]The fourteen cases are: *South Carolina v. Georgia*, 93 U. S. 4 (obstruction to navigation); *Missouri v. Illinois*, 180 U. S. 208, 200 U. S. 496 (pollution from sewage); *Kansas v. Colorado*, 185 U. S. 125, 206 U. S. 46 (alleged wrongful diversions); *New York v. New Jersey*, 249 U. S. 202, 256 U. S. 496 (pollution from sewage); *Tennessee v. Arkansas*, 249 U. S. 588 (flood damage); *North Dakota v. Minnesota* and *South Dakota v. Minnesota*, 256 U. S. 220, 263 U. S. 365 (flood damage); *Wyoming v. Colorado*, 269 U. S. 419, 286 U. S. 494, 298 U. S. 573, 309 U. S. 572 (transbasin diversion); *Wisconsin v. Illinois*, 278 U. S. 367, 281 U. S. 179 (Great Lakes drainage); *Connecticut v. Massachusetts*, 282 U. S. 660 (transbasin diversion); *New Jersey v. New York*, 283 U. S. 336 (transbasin diversion); *Arizona v. California*, 283 U. S. 423 (validity of Colorado River Compact and Boulder Canyon Project Act); *Washington v. Oregon*, 297 U. S. 517 (alleged wrongful diversions); *Arizona v. California*, 298 U. S. 558 (apportionment of unappropriated waters).

fisheries and the recreational facilities along the stream required the limitation on the diversions. Thus in each case an injuction was granted against the taking of the water from its natural bed for use in another water shed and in each case the injunction was granted to protect prior uses.

The contrast between those three cases and that now presented to the Court is striking. Here Kansas is complaining, as it complained in the former suit, against long existing irrigation uses in Colorado. *These uses are all in the basin of the Arkansas river.* No new, different or unusual situation is mentioned either in the Kansas pleadings or evidence. Perhaps Kansas will challenge this statement upon the theory that Caddoa constitutes a threat. If it does the threat comes from the United States not Colorado. The dam was built by the United States Army after both Colorado and Kansas representatives had urged upon Congress the desirability of its construction. There can be no conservation storage unless an appropriation is made under Colorado law. There is nothing in the record to show that Colorado, or any of its citizens, is attempting, either directly or indirectly to obtain a storage priority for Caddoa.

Never has this Court undertaken to make a definite division of a water supply between states under circumstances such as are here presented. Never has the Court intimated that, if States fail to agree over the division of a water supply, they may rush to the Court and secure from it a formula which will be a cure-all for their administrative problems. Never has the Court imposed any restriction or limitation on the quasi-sovereignty of a state in the absence of a showing of serious injury to another state. Surely, if the vitality of the states is to be retained, the old rules should not now be either abrogated or relaxed. To grant relief, to decree an administrative scheme, or to adjudicate a cure-all for a social-economic problem every time states disagree among themselves is to destroy all incentive for that interstate cooperation which is essential to our federal system.

KANSAS HAS FAILED TO SUSTAIN THE BURDEN OF PROVING THAT THERE HAS BEEN A MATERIAL INCREASE IN THE DEPLETION OF THE STREAM BY COLORADO.

(a) The Theory That an Increase in Irrigated Acreage Indicates an Increase in Permanent Depletion of the Water Supply Is Fallacious.

The argument made at pages 68-73 of the defendants' brief is that the increase in the Colorado irrigated acreage establishes an increase in the permanent depletion of the stream in Colorado. The Colorado answer is that stream depletions are measured by the consumptive use of water (diversions less returns to the river) and are not measured by irrigated acreage.

First let us consider what has been the increase in irrigated acreage. The United States Census Bureau, which is the only agency that reports upon the question of acreages irrigated in all states under the same methods of definition and classification, gives the following statistics as to the Colorado irrigated acreage in the Arkansas river basin: 1902—300,115; 1909—464,236; 1939—469,168 (See App. A, p. 90). Thus the increase from 1909 to 1939 is less than 5,000 acres. Kansas makes much of the 1902 figure and bases its computations thereon. The answer to such an approach seems obvious. Kansas itself did not consider this increase sufficient to justifiy any action against Colorado and waited about twenty years, until it filed its cross-bill in this case, to assert any claim against Colorado. Surely if the increase from 1902 to 1909 had the effect which is now asserted the Kansas officials, who are presumed to do their duty, would have sued Colorado in 1909.

A second consideration is that an increase in irrigated acreage can take place, and in this instance has taken place, without any increase in stream depletion. This subject is discussed in detail in Appendix A to our opening brief, pp. 72-87, and we shall here merely note the responsible factors which are (1) increase in return flows resulting from the filling of the water table under the irrigated areas; (2)

improvements in the duty of water resulting from increased efficiency in the conveyance, application and use of water; (3) the construction of artificial drainage; and (4) the importations of water from other systems amounting to approximately 60,000 acre-feet in 1938.

For statistical proof of the Colorado position we refer to the table on page 33 of our opening brief. It is there shown that the average ditch diversions in the Pueblo to state line section for the period 1904-1911 was 906,000 acre-feet and for the period 1931-1940 was 787,000 acre-feet.

Colorado should be commended, not condemned, for making such a use of the limited water resource of the Arkansas basin that it has been able to increase its irrigated acreage without increasing its depletions of the stream flow. If the Kansas farmers were as resourceful and as efficient, they would make use of the large flow that now passes Garden City unused.

(b) The Meeker "Analytical Study" is Based Upon Estimates and Assumptions, is Thoroughly Discredited, and Does Not Constitute the Clear and Convincing Evidence Necessary to Justify a Decree Against a State.

The defendants rely upon the so-called "analytical study" of witness Ralph I. Meeker, a former employee of the state of Colorado,[8] to establish the fact that since the 1907 decision there has been an increase of stream depletion amounting to 300,000 acre-feet annually by Colorado (see defendants' brief, pp. 76-81 and insert of Kans. Ex. 70.) The asserted theory of the witness is that a comparison of years of comparable water supply shows the claimed depletion.

The methods used by the witness Meeker are discussed at pages 76-86 of Appendix A to our opening brief. We there showed the methods of estimation and assumption em-

[8] His employment was as Deputy State Engineer and was of a confidential nature (Tr. p. 1759). It continued for nearly a year after the bringing of this suit (Tr. p. 1832).

ployed and we pointed out that different methods were used for the period 1905-1911 than were used for the period 1912-1930, the two periods which the witness compared to arrive at the claimed increase of 300,000 acre-feet in stream depletion. Common sense and scientific reasoning both require that if estimated values are to be compared the same methods of estimation should be followed in determining the values to be compared. The most that can be said for the Meeker study is that it displays a remarkable mathematical ingenuity.[9]

The defendants have reproduced Kansas Exhibit 70 and inserted it at page 76 of their brief. So much reliance is placed on this complex and bewildering exhibit, and the Meeker testimony based thereon and in explanation thereof, that we are inserting as Appendix C to this brief a critical analysis and a reproduction of certain of the cross-examination of Mr. Meeker. It is sufficient to point out here that in making his assumptions of water supply the witness disregarded the records as to precipitation at the numerous weather bureau stations throughout the basin. Precipitation is the source of the water supply. Except for extraordinary climatic disturbances of a purely local nature, the water supply must and does vary with the precipitation over the basin. The failure of the witness to correlate his total water figures for each year with the precipitation for that year is alone sufficient reason for disregarding the highly theoretical "analytical study."

Upon the basis of the Meeker study the flat statement is made on page 81 of the Kansas brief that "since the close of testimony in the original Kansas-Colorado suit the consumption of water in Colorado has increased to the extent of 300,000 acre-feet of the average yearly dependable

---

[9] The effectiveness of the Meeker evidence is materially weakened, if not entirely destroyed, by his statements on cross-examination that the diversion records show no material change in Colorado diversions since 1905, that if acreage in Colorado has expanded under the ditches on the main stem, it has done so because of an improved duty of water, that during the period the river gains due to return seepage have increased, that the consumptive use of water has declined, and that relatively the stream flows have improved (Tr. p. 1936).

supply." The statement will not stand any critical analysis. The parties appear to be in agreement that the average annual state line flow for the period 1908-1938 was 260,700 acre-feet. If the average depletion was 300,000 the average earlier flow would have been that much greater or 560,700 acre-feet. Yet Kansas Exhibit 70 gives the following 5-year means for the Holly outflow:

Years	Outflow in Acre-Feet
1895-1899	300,000
1900-1904	470,000
1905-1909	454,000
1910-1914	236,000
1915-1919	198,000
1920-1924	476,000
1925-1929	272,000

It will be remembered that the values prior to 1908 shown on Kansas Exhibit 70 for the Holly outflow were estimated, not measured, values. Even on the Kansas estimates it is clear that an increased depletion of 300,000 acre-feet annually could not and did not take place.

The records of Colorado consumption (Tables 3b and 3c, pp. 77, 78, App. A), the records of Colorado ditch diversions (Tables 3c, 4 and 5, pp. 77-82, App. A), the records of total, divertible and usable state line flows (Colo. Exs. 209, 211, 214, 215, pp. 61-67, App. B), all prove the falsity of the Kansas claim that there has been an increase of 300,000 acre-feet on an annual average in the Colorado depletions since the former decision.

Finally, we direct attention to the fact that this assertion of an increased depletion averaging 300,000 acre-feet annually is a repudiation of the position taken by Kansas in the former suit. In 1901 Kansas pleaded that Colorado had totally destroyed the normal flow of the river exclusive of floods (206 U. S. 52-53). Now Kansas says that the flow at the time of the former suit was such that Colorado has been able to deplete it on an annual average of 300,000 acre-feet. It is remembered that the average state line flow (1908-1938) was 260,700. Hence if Kansas is now correct, the flow, which in 1901 was destroyed, actually amounted to

560,700. The obvious contradiction casts a cloud both upon the reliability of the Kansas evidence and the sincerity of the Kansas position.

(c) The Attempted Showing That Colorado Reservoir Storage Has Deprived Kansas of Usable State Line Flows Is Inconclusive.

At pages 101 to 108 of their brief the defendants attempt to show that Kansas has been deprived of water by storage in Colorado. On page 105 is a table, one column of which contains an enumeration of the number of days during the summer period of the years 1912 to 1931 inclusive when the state line flow was less than 200 c. f. s. On the following page is a table purporting to show the net gain in Colorado storage during the months of May, June, July and August during the years 1926 to 1932 inclusive. The point which opposing counsel seek to make from these tables is that Colorado by storing water during the summer months has decreased the supply available for irrigation in Kansas during the same months. If it is borne in mind that Kansas can only be affected by a decline in divertible state line flows, the fallacy of the argument is at once apparent. There is no showing anywhere in the Kansas brief or evidence that the amounts of water stored consisted of anything but flood spurts which, if not stored, would have passed out of the irrigation portion of the basin unused.

The conservation storage of both flood waters and winter flows is both desirable and proper. By such a practice the greatest beneficial use of a limited water resource is obtained. Evaporation losses which are emphasized on page 101 of the Kansas brief are unimportant in the overall picture as they represent water which would have been unused in any event.

The showing that in a certain month or year the stream flow at the state line was less than 200 c. f. s. for a certain number of days while during the same year or month Colorado storage increased a certain amount does not prove any depletion in divertible state line flows. It is

more reasonable to assume that the storage took place in times of flood than otherwise. The Colorado storage rights are inferior to all important Colorado direct flow rights. The Kansas theory requires the assumption that Colorado owners of direct flow rights are going to forego their uses in order to permit the accumulation of storage. Such unselfish benevolence is not common.

In any event the Kansas theory is exploded by the recorded statistics which, as we have pointed out again and again, show an increase in divertible state line flows since the former decision (See Colo. Ex. 211, p. 63, Appendix B).

(d) The Variability of the State Line Flow Does Not Prove Any Increase in Stream Flow Depletion.

The brief of the defendants (pp. 81 to 100) attempts to make much of the variable character of the state line flow. They submit three hydrographs and many tables in an endeavor to bolster their claim of stream depletion. All this effort may be summarized by the statement that there is extreme variability in the state line flow. This, we freely admit. *The point is that nowhere in argument or evidence has Kansas made any showing that this variability is any greater now than it was at the time of the former decision.*

In 1907 this Court said (206 U. S. 115):

> "That there is a great variance in the amount of water flowing down the channel at different seasons of the year and in different years is undoubted; that at times the *entire bed of the channel has been in places dry* is evident from the testimony."

In 1943 the Master found (Report p. 5):

> "The character of the flow of the river in Colorado is variable from year to year and season to season and day to day, and the main river at any one point may be almost without water one day and have a flood in it the next day and the following day have practically its original condition."

Kansas has taken no exception to the above quoted finding of the Master.

When Kansas complains of the variable state line flow, it complains of a condition produced by nature, not a condition produced by Colorado.

If there is any doubt about the conditions of stream flow prior to the former decision it should be dispelled by the statement of the United States Census Bureau report for 1900 wherein, with reference to the Kansas irrigation ditches, it was said (Tr. pp. 3506-3507, App. A, pp. 109-110):

> "The water supply for most of these ditches was to have been taken from the Arkansas river, but it proved wholly inadequate for that purpose, and hundreds of miles of ditches had to be abandoned. The principal irrigated areas are along this river, where the conditions are somewhat similar to those along the Platte river in Nebraska. *Its broad shallow channel is dry for a considerable part of the year;* water, however, is seeping beneath the surface of the valley lands, as well as under the stream bed. The ditches operated at the present time can receive water only at times of flood, and are utilized largely in the cultivation of forage crops."

Kansas, while it attempts to make much of the variable character of the state line flows has by its own evidence shown that there has been an increase in divertible state line flows. We refer to Kansas Exhibit 70 which has been reproduced in the Kansas brief (p. 76). The graph at the top of this exhibit shows in solid black "water divertible-Kansas canals April to October." In the twelve years 1895 to 1906 inclusive, divertible water is shown to have been present only in two years, 1903 and 1905. In the twenty-four-year period 1907-1930 divertible water is present in at least eighteen of the years. Thus the Kansas evidence sustains the Colorado showing (Colo. Ex. 211, App. B, p. 63) that the divertible state line flows have increased. It is not necessary to pursue the inquiry further.

KANSAS HAS FAILED TO SUSTAIN THE BURDEN OF PROVING THAT THERE HAS BEEN AN INJURY TO ITS SUBSTANTIAL INTERESTS BY REASON OF ANY INCREASE IN STREAM FLOW DEPLETION BY COLORADO SINCE THE FORMER DECISION.

(a) An Increase by Colorado in Stream Depletion Does Not Require an Affirmative Decree of Equitable Apportionment Unless There Is a Resulting Injury to the Substantial Interests of Kansas.

It will be recalled that the Court in its direction for the entry of a decree in 1907 specifically said that the Kansas bill was dismissed without prejudice to the right of Kansas to institute new proceedings when because of a material increase in stream flow depletion by Colorado, the substantial interests of Kansas are injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river. Hence in order for Kansas to avoid the application of the rule of *res adjudicata* it must show such an injury to its substantial interests as destroys the equitable apportionment between the states. By its dismissal of the Kansas bill in 1907 the Court necessarily held that nothing which Colorado had done up to that time had destroyed the equitable apportionment.

(b) The Kansas Showing of Irrigable Land Which Might Have Been Irrigated Except for Stream Depletion by Colorado Is Not a Showing of Injury to Its Substantial Interests.

The only showing of injury which Kansas attempts to make is that there is in the western counties of the state irrigable land, the development of which (Brief, pp. 64-65) "undoubtedly could and would have taken place except for Colorado diversions."

Nowhere in the record, in the Master's report, in the Kansas Exceptions or in the Kansas Brief, is there any claim that any Kansas enterprise, dependent upon the use of water of the Arkansas river, is in any worse condition now than it was in 1907. Since the position taken by Kansas in its pleadings, in its evidence, and in its brief is that

the case involves the need of Kansas for water for irrigation purposes, it is unnecessary to discuss domestic or industrial uses. The issue is limited by Kansas itself to irrigation requirements. It follows that for Kansas to make a showing of injury to its substantial interests it must, in order to maintain its cross-bill, establish by clear and convincing evidence that since the 1907 decision the Kansas farmers have been deprived of irrigation water which they formerly used. On this proposition the increase in the Kansas irrigated acreage from 34,879 acres in the five counties wherein irrigation from the surface flows of the Arkansas river is practiced in 1909, to 64,104 acres for the same five counties in 1939, and the increase in Kansas ditch diversions from a calculated average of 59,200 for the period 1908 to 1913 inclusive to an average of 99,100 in the period 1933 to 1938 inclusive indicate beyond the shadow of a doubt that instead of any harm having resulted since 1907 there has been a definite and substantial improvement.

Whatever irrigable land there is now was also in existence in 1907. There is no showing of any change in this regard. Obviously there could be none. The character of the soil and the nature of the topography are fixed.

All that Kansas can possibly claim is a speculative injury. Their argument that if Colorado had not used the water they would have used it did not entitle Kansas to relief in 1907, and should not be recognized when it is reasserted thirty-six years later.

THE MASTER'S RECOMMENDATIONS AND THE MODIFICATIONS REQUESTED BY KANSAS ARE INEQUITABLE AND UNFAIR TO COLORADO.

(a) Kansas Agrees with Colorado That the Master's Recommendations Are Ambiguous and Uncertain.

In our opening brief we pointed out at some length the ambiguity and uncertainty of the Master's Findings of Fact, Conclusions of Law and Recommended Decree. In its brief Kansas admits in several places, as for example

page 144, that the Master's report is ambiguous and uncertain. The difference between the position of the parties is that Kansas accepts the basic findings and conclusions of the Master and directs its exceptions to such revision and modification thereof as will further the Kansas interests. Colorado says that the nature of the report is such that it is impossible to rewrite it so as to make it either fair to both states or workable.

(b) The Changes Requested by Kansas.

As indicated by the Kansas exceptions and brief, Kansas does not object to the division of what is called the dependable water supply upon the basis of 185,000, or one-sixth to Kansas, and 925,000 acre-feet, or five-sixths to Colorado. The Kansas contention is that provisions should be inserted which would define the Kansas share as 30.87% of the water as it accrues day by day at the Canon City and Purgatoire gauging stations. This water, they say, should be delivered to Kansas when and as required by the Kansas officials. Water crossing the state line in excess of either the daily accruals to the Kansas account or the demands of the Kansas officials should not be charged to Kansas.

The gross inequity to Colorado of a decree embodying such modifications and revisions of the Master's Recommendation is obvious. In the first place we repeat again that Kansas is not entitled to a regulated water supply. It did not have that in the days before irrigation. Certainly there is nothing in the relationship of the states of our Federal Union which requires an upper state to give a lower state an advantage which it would not have in a condition of nature. In the second place the idea of delivering upon demand water which accrues day by day is self-contradictory and impossible of performance. In the third place to award to Kansas a percentage of the water as it accrues day by day at stations many miles above the state line without any charge upon Kansas for conveyance losses is to impose upon Colorado the wholly unfair and inequitable burden of standing all losses of water resulting from

such natural causes as evaporation, transpiration and percolation.[10] In the fourth place at the time of the former decision Kansas was not using and probably would not use now if it could receive the amount of water for which the defendants ask. In the fifth place delivery only upon demand by the Kansas water officials would enable Kansas to time its demands so as to receive without debit against its allocated share practically all of the stream accretions between Caddoa and the state line, amounting on an annual average of 123,900 acre-feet (App. A. p. 147) as the Colorado ditches can make little or no use of these accretions which largely enter the stream below the Colorado ditch headgates. Finally, to allot to Kansas any such amount of water is to curtail Colorado's uses which have existed for many years and which were in existence at the time of the former decision.

(c) The Master Did Not Recommend That Kansas Is Entitled to 30.87% of the Index Flows.

The theory of Kansas is that the Master intended that Kansas should receive 30.87% of the combined flow at the Canon City and Purgatoire gauging stations. There is nothing in the report of the Master which justifies this position. The Master merely found that Kansas was entitled to one-sixth of what he deemed the dependable water supply. The Master recognized that this supply varied from year to year and that the 185,000 acre-feet, which he considered to be Kansas' share in the average year, should fluctuate with the water supply. It is true that the Master provided for two index stations, but he did not at any place in his report provide for any allocation except on a one-sixth basis. It is a reasonable inference that his intent was to award to Kansas one-sixth of the index flows. Certain it is that he never used the percentage of 30.87, and

[10] Attention is directed to the testimony of Kansas, witness Meeker (Tr. p. 2039) that, "In order to deliver comparatively small volumes of direct flow water for irrigation on the lower end of such rivers—that refers to the Arkansas, South Platte, North Platte and Rio Grande—to relatively small areas, large volumes of water are, and would be, required to satisfy channel losses."

recommended no formula for the ascertainment of any percentage other than 16.67%, or one-sixth.

Kansas bases its claim to 30.87% of the index flow upon the theory that the combined flow of the index stations, amounting to 670,380 in the period 1908 to 1938, represents 54% of the average annual water supply of the basin found by the Master to amount to 1,240,000 acre-feet (Brief, p. 129). They then relate 16.67% to 54% and come out with the answer 30.87% as the figure which should determine the Kansas share. They have no explanation for the use of the figure 1,240,000 acre-feet, which the Master finds to be the average annual water supply, instead of 1,110,000 acre-feet, which the Master finds to be the average dependable water supply. In this connection we again point out that *there is no possible way of measuring either the total average annual water supply or the total average annual dependable water supply.* One thing is certain however; if there is any dependable water supply in the Arkansas basin it is the water which passes these two gauging stations. Hence, if any credence whatever is to be given to the Kansas theory, the figure for the average annual dependable supply should be used in determining the relationship rather than the figure for the average annual total supply.

(d) Any Decree Awarding to Kansas a Percentage of the Index Flows and Having the Effect of Impairing Early Colorado Priorities Would Violate Colorado's Right to an Equitable Apportionment of Stream Flow.

The Kansas argument is that an award of 30.87% of the index flows will give to Kansas the 185,000 acre-feet which the Master says represents the Kansas portion of the average annual dependable supply. This statement is incorrect. Kansas has used in its own exhibit (Kans. Ex. 134, App. B, page 73) and in its brief (pp. 128-129) the figure of 670,380 acre-feet as the average annual flow of the combined index stations. 30.87% of 670,380 acre-feet is 206,946 acre-feet, or more than 21,900 acre-feet in excess of the Master's recommendation.

Kansas seeks to appear magnanimous by asserting (brief pp. 47-48) that it is willing to accept the allocation of 185,000 acre-feet even though this is less than the average of 260,700 acre-feet which was the annual average amount crossing the state line in the period 1908 to 1938, and it says that it has not excepted to this small apportionment because it is the manifest intent of the report that water be delivered "in accordance with irrigation needs and upon the demands of the state water officials." We deny that such is the intent of the report. Nowhere in the report is there any provision requiring a delivery by Colorado on demand. The language used with reference to the 35,000 acre-feet of winter flow is "as the same could be delivered for irrigation or storage when required by the water officials of Kansas." (Master's report, Findings of Fact, Paragraph Nine, Conclusions of Law, Paragraph Three). The language in the decree, which we insist applies only to the winter water and which would conflict with the Findings of Fact and Conclusions of Law if applied to both summer and winter water is this, "at such times and in such amounts as and when required by water officials of the State of Kansas." The term "as and when required" carries with it the meaning that the water must be reasonably needed for irrigation purposes. The term "demand" eliminates the element of need.

It must be remembered that the figure of 260,700 is an average figure arrived at by taking into consideration all state line flows including all floods. If in arriving at the average the unusually large stream flows occurring in the years 1914, 1915, 1921 and 1923 are excluded, the average state line flow would be 194,400 acre-feet annually, divided into 116,500 acre-feet of April-September flow, and 77,900 acre-feet of October-March flow. The Master proposes that Kansas be awarded 150,000 acre-feet of summer water, or 33,500 acre-feet in excess of the average state line flow if the four large water years are excluded. (The above computations are from Colo. Ex. 204, App. B, pp. 54-58).

If we assume for the sake of argument that it was the intent of the Master to require Colorado to deliver water as

and when required at the state line, the assumption least harmful to Colorado would be that Kansas would be chargeable with all divertible state line flows.[11] If the four high water years above noted are eliminated in computing the average state line flows and if also the non-divertible state line flows are excluded from the accounting, the computation shows the average divertible state line flow to be 143,800 acre-feet, divided into 81,400 of summer flow and 62,400 acre-feet of winter flow; thus there will be a deficiency under these conditions of 68,600 acre-feet in Colorado's ability to meet the summer requirements proposed by the Master. This amount of water can only be secured by the curtailment of Colorado uses long existing prior to 1895. Considered in the light of these figures the magnanimity of Kansas is easily understandable.

In every case such as this there is an ever present tendency to become so involved in the great mass of statistics that it is difficult to see the answer. Hence, it may be well to appraise the situation from the standpoint of the common farmer who is vitally concerned with securing water for the irrigation of his crops and who knows little, if anything, about engineering analytical studies or legal imponderables. To the man who works with a shovel turning water from an irrigation ditch into his fields, there is one salient and unforgetable feature of the Master's report. The Master finds that in Colorado there are approximately 470,000 irrigated acres in the basin and in Kansas approximately 65,000; yet he gives to Colorado 925,000 acre-feet of water on an annual average, or less than 2 acre-feet per acre, while he gives to Kansas 185,000 acre-feet, or more than 2.8 acre-feet per acre. The farmer looks at these figures of acreage and water, makes the simple comparison, realizes that the need for water is less in Kansas than it is in Colorado and then sends forth his sincere complaint that Colorado has been ill treated. There is merit in this simple method of approach.

---

[11] By divertible state line flows we mean flows within the diversion capacity of the existing Kansas ditches which is approximately 2,000 second feet. This use of the term divertible corresponds with the definition of the term found on page 85 of the Kansas brief.

In this connection it is well to bear in mind the admission of Kansas counsel on page 27 of their brief that in the Kansas area between the state line and Garden City there were in 1939 only 29,239 acres maintaining irrigation without the use of supplemental water secured from pumping plants. Colorado Exhibit 135, an excerpt from United States Department of Agriculture Technical Bulletin 36, shows that the seasonal net irrigation requirement in acre-feet per acre for western Kansas is 1.75. Upon this basis the 29,239 acres of Kansas land which depend solely upon surface flows require 51,165 acre-feet of water annually.[12]

Water to recharge the ground storage can and does occur at irregular intervals, frequently as floods, and is not needed upon any basis of when and as required. It cannot be denied that the historical winter flows have always been large enough to recharge the ground storage. (See statement of Kansas witness Knapp quoted on pages 107-108, Appendix A).

These factors which we have just mentioned, and others which appear in our former brief and appendices, make it clear that any award to Kansas of the amounts claimed by that state can only be justified upon the ground that, if they are obtained, additional land will be irrigated. *If additional land is not irrigated, then the water will pass out of the basin unused and Colorado will have suffered a grievous detriment without there being any benefit whatsoever to Kansas.* If additional lands are put into irrigation in Kansas to use these additional amounts of water, then what will have taken place will be a reshuffling of the economic civilization which now exists in the Arkansas valley. Colorado has had for over fifty years the facilities necessary to put to beneficial use all this water which Kansas would now take away. Facilities for the use of such large additional amounts do not exist in Kansas. *There is no assurance that they will ever be constructed in Kansas and*

[12] This figure approximates the 52,000 acre-feet figure for summer delivery fixed by the Stipulation of 1933 (Colo. Ex. 179, App. B, pp. 30-35).

there is no certainty that if they are constructed the Kansas farmer will use them. The most that can be said is that there will be a possible benefiit to Kansas if its farmers will use additional water. Thus the proposition of taking water away from existing uses in Colorado is predicated upon a foundation of doubt, speculation and conjecture.

(e) The Kansas Proposals Would Destroy the Irrigation Development of the Arkansas Valley in Colorado Below Canon City.

We have shown in our opening brief and in the argument just presented herein that the Kansas proposals could only be satisfied by the curtailment of Colorado uses. Now we desire to point out just how disastrous their effect, if adopted, will be. Kansas by its Exception Nine, and argument in support thereof, urges that the Master's Finding of Fact Nine and Conclusion of Law Three "should be made to conform to Paragraph Two of the proposed decree in order that the delivery of *all* of the water allocated to Kansas should be made when and as required by the water officials of the State of Kansas." (Kansas Brief, p. 39).

If this language, or any similar language, is inserted into the decree then disaster has come to the Colorado portion of the Arkansas river basin. A civilization will be wiped out more thoroughly than if a great air armada had bombed every city, town, farmhouse, reservoir and irrigation ditch. This is not idle talk nor an appeal for sympathy. It is a cold hard fact.

We need not again call attention to the fact that a water supply of extreme variation cannot be delivered on demand. We need not again direct attention to the inconsistency of the Kansas position which seeks both an award of the percentage of the index flows as they accrue day by day and the delivery of the amounts of water so determined as and when required. We need not again refer to the enormous losses between Canon City and the state line in the channel of the Arkansas river which was aptly characterized in the former case as a "sieve" (206 U. S. 52-53).

The records show, and the facts cannot be disputed, that in every year in many months there are large and important canals in eastern Colorado such as the Fort Bent, the Amity, the Catlin and others with very early priorities which are diverting no water from the river whatsoever because there is none there, although there is often a substantial quantity flowing past Canon City.

A comparison of the Colorado priorities along the main stem of the river with the stream flows will indicate the problem. The following table compiled from Kansas Exhibit 2 shows the priorities:

PRIORITIES OF PRINCIPAL ARKANSAS RIVER DITCHES—CANON CITY TO STATELINE

Ditches (Downstream Order) Canon City (G.S.)(a)	Senior to 1884	Year 1884	Years 1885-86	Year 1887	Years 1888-89	Years 1890-91	Years 1892-95	Totals*
Canon City and Oil Cr.	24.73							24.73
Fremont County	17.00							17.00
Union	48.00							48.00
Ark. Val. Conduit	70.00							70.00
Bessemer	70.65			318.00				388.65
West Pueblo	3.20			15.00				18.20
City Pueblo (N.S.)	25.53							25.53
City Pueblo (S.S.)	27.77							27.77
Sum to Pueblo	286.88			333.00				619.88
Booth	18.00				2.10		10.20	30.30
Excelsior				20.00		40.00		60.00
Collier				26.00				26.00
Colorado						756.28		756.28
Hiline	56.60		32.00			380.50		469.10
Oxford	13.40			116.00				129.40
Otero						123.00		123.00
Catlin	22.00	226.00		97.00				345.00
Holbrook					155.00		445.00	600.00
Rocky Ford	111.76					96.54		208.30
Ft. Lyon		164.64		597.16			171.20	933.00
Jones	22.30	27.50			80.00			129.80
Town		32.50						32.50
Sum (Pueblo-Caddoa)	244.06	450.64	32.00	856.16	237.10	1396.32	626.40	3842.68
Sum (C.C.-Caddoa)	530.94	450.64	32.00	1189.16	237.10	1396.32	626.40	4462.56
Keesee	13.50						15.00	28.50
Ft. Bent			27.77		44.47	26.27	50.00	148.51
Amity				283.50			500.00	783.50
Lamar	15.75		72.09	13.64		184.27		285.75
Hyde				23.44				23.44
Manvel						54.00		54.00
Graham						61.00		61.00
X. Y.					69.00			69.00
Buffalo			67.50					67.50
Sisson					6.85	18.00	7.20	32.05
Sum (Caddoa-Stateline)	29.25		167.36	320.58	120.32	343.54	572.20	1553.25
Total (C.C.-Stateline)	560.19	450.64	199.36	1509.74	357.42	1739.86	1198.60	6015.81

(a) Exclusive of priorities diverted above Canon City (G.S.): C.C. Pipeline 22.50—1863-64; C.C. Hyd. and Irr. 77.00—1866; and South Canon 43.51—1866-82.

*Exclusive of subsequent enlargement priorities: Ft. Bent 80.00—1900; Otero 334.92—1903 and Jones 44.80—1909; there are no others.

In the next table the priorities are assembled chronologically first for the Canon City to Caddoa section and next for the Caddoa state line section:

COLORADO PRIORITIES FROM MAIN RIVER CANON CITY TO CADDOA
(Values in Second Feet)

Priority	Amount	Combined Total
Senior to 1884	530.94	
1884	450.64	981.58
1885-1886	32.00	1,013.58
1887	1,189.16	2,202.74
1888-1889	237.10	2,439.84
1890-1891	1,396.32	3,836.16
1892-1895	626.40	4,462.56

COLORADO PRIORITIES FROM MAIN RIVER CADDOA TO STATE LINE

Priority	Amount	Combined Total
Senior to 1884	29.25	
1884-1886	167.36	196.61
1887	320.58	517.19
1888-1889	120.32	637.51
1890-1891	343.54	981.05
1892-1895	572.20	1,553.25

Consider now the stream flows. The following table compiled from Colorado Exhibit 204 shows the average daily flows during the six summer months in cubic feet per second at the two proposed index stations, the total and the amount required at the state line to satisfy the Kansas pro-

posal without any regard to an as and when required delivery:

Month	Canon City	Purgatoire	Total	30.87% of Total
April	401	99	500	154
May	1,050	198	1,248	385
June	2,197	204	2,401	741
July	1,446	318	1,764	544
August	882	393	1,275	396
September	495	145	640	199

It thus appears that, during the month of the greatest average flow at Canon City, the flow (2,197 c. f. s.) is insufficient to satisfy Colorado priorities in the Canon City to Caddoa section dated 1887 or earlier (2,202.74 c. f. s.).

Likewise during the month of the greatest average Purgatoire flow (393 c. f. s.) the Colorado priorities in the section Caddoa to state line dated in or prior to 1887 and amounting to 517.19 c. f. s. cannot be satisfied.

If these flows are further reduced, their inadequacy to satisfy Colorado rights under 1887 or earlier priorities is greatly increased. If in addition the Kansas deliveries are on a demand basis, the inadequacy of the flows is such that rights dated prior to 1884 would undoubtedly be affected, but it is impossible to compute the amount because it is impossible to guess what whims may motivate the Kansas officials in asserting the rights of the lower state. To make any explanation of the possible result it is necessary to speculate. Let us assume a month in which it rains during the first fifteen days with the result that Kansas would not demand any water and let us assume further that the daily average flow for the month at Canon City is 1,500 c. f. s. In this situation the water then flowing across the state line would not be counted. For the last sixteen days of the month Kansas officials might demand that Colorado deliver to the state line a continuous daily flow of 900 c. f. s. (This amount would be necessary to meet the monthly quota if no water were charged for the first half of the month). In such a situation the headgate of probably every Colorado ditch from Canon City to the state line would be closed, and it is doubtful whether or not Kansas

would even then obtain more than a fraction of such a flow. It is obvious that Kansas could manipulate its demands so as to impose unbearable hardships on Colorado. Whenever there are rains in Kansas, whenever there are floods down the tributaries entering the stream in eastern Colorado, Kansas will stop demanding water and none of the state line flows could, under the defendants' theory, then be charged to it. Meanwhile the rights to the water accruing day by day at the index stations would build up to such an extent that when the demand would finally be made it would be impossible of satisfaction.

Kansas' proposal would so disrupt the administration of the river in Colorado as to cause the utmost chaos, confusion and injustice. Suppose 1,500 c. f. s. were in the river at Canon City on a given August 1. It would require four or five days for any portion of that water to reach the state line.[13] Yet Kansas might well say that it had a right to demand an immediate delivery of 30%, or 450 c. f. s. Assuming that on the same day the flow of the river at La Junta was 200 c. f. s., to supply the Kansas demand every headgate between La Junta and the state line would have to be closed and Kansas still would be short. On the other hand assume that Kansas would wait until August 4th to make its demand. In the meantime Colorado ditches would have taken their full priorities with the result that when Kansas demanded the water the lower Colorado ditches would have to be curtailed in their use or shut down entirely to supply the accumulated Kansas demands. Under such a condition the upper Colorado ditches would be supplied in full and the lower ditches would receive nothing as a result of the whims of Kansas water officials.

Under such a situation no man with the ability to operate a farm successfully would want to own a farm dependent upon the use of Arkansas river water for irrigation in Colorado. It is a fair prophecy that if the Kansas proposals are put into effect the first result will be the institution in Colorado of as many law suits as the resources of the farmers will permit. As a result of this litigation

[13] See testimony of Witness Meeker (Tr. p. 1808).

perhaps one or two ditches with old water rights will obtain a preferential position that will enable them to irrigate some of their present acreage. The rest of the Colorado irrigated land in this basin will go back to sage brush and cactus.

The difficulty of carrying out a required delivery schedule from Colorado were admitted by Kansas witness Meeker. Such a requirement would necessitate curtailing Colorado uses and providing a burden of storage and would be almost impossible under the variations of the flow of the river. (Tr. pp. 2088, 2093, 2096 and 2097).

(f) A Common Sense Approach to a Decree of Equitable Apportionment Requires That Before Any Such Decree Be Entered a Careful Analysis Be Made to Determine Its Probable Effect.

It is not being merely oratorical to say that the future of the Arkansas valley is at stake in this case. Colorado has full confidence in its position that no decree should be entered attempting to define for all times the rights of the two states. We would be somewhat less than frank if we failed to recognize the possibility that the Court might not agree with us. If such is the case and there is to be a decree attempting to define with precision the quantum of water to which each state is entitled, then, if a real equitable apportionment is to be made, it is absolutely necessary that a competent engineering study be made to determine how the decree will operate. If such a study is not made, then the use of an important natural resource is being determined without proper regard for the available means of knowledge.

The Master's recommended apportionment is not justified by anything which appears in the record in this case. Neither party proposed it. No expert irrigationist testified how such a division of the water supply will affect the two states.

Colorado started this litigation for the purpose of ending the harassment of the private litigation. Kansas by its

cross-bill sought an equitable apportionment and prayed for a decree defining "the rights of residents and citizens of Kansas to divert water from the Arkansas river for the purpose of agricultural irrigation of lands in Kansas • • • in second feet." (Kansas Answer p. 47). In the first few years of the taking of testimony the evidence of Kansas related to the proof of priorities, apparently designed in support of a schedule of interstate priorities regardless of state lines. Later the Kansas witnesses Meeker and Knapp gave their engineering testimony apparently in support of the theory that Kansas be awarded an annual amount of water in terms of acre-feet. It was not until the final hearing before the Master that there was any suggestion of index stations. The Kansas witness Knapp presented Kansas' Exhibit 134 showing the combined flow at the Canon City and Purgatoire stations for the period 1908 to 1938 and suggested that Kansas be given 50% of this combined flow. His testimony as to this division was nullified by his admission under cross examination that the present Kansas ditch diversions constitute about 13.5% of the flow of the two stations which he suggests as an index (Tr. p. 7070-7071). Except for this evidence of Mr. Knapp there is nothing said in the long record about a decree giving to Kansas any percentage of any index flows. There being no such evidence and there being no such claim asserted by Kansas there was, of course, no evidence as to how any such division might affect the two states. Now the Master recommends a divison suggested by neither party and Kansas by its exceptions seeks modifications of the Master's recommendation which were never even dreamed of when the evidence was being introduced.

In our opening brief we showed that the obligation for Colorado to deliver 27.6% of the index flows to Kansas at the state line would require, under historical conditions, a curtailment of Colorado uses in excess of 44,000 acre-feet annually, even though Kansas were chargeable with all water crossing the state line up to the seasonal delivery obligation. It is obvious that if the percentage is increased to 30.87% as contended by Kansas and if any limitations

whatsoever are placed upon the flows chargeable to Kansas, then the curtailment of Colorado uses will be increased to an extent which cannot now be forecast.

A case of the importance of this should be determined upon the basis of knowledge, not upon the basis of guess.

(g) Administration to Protect Colorado Is Just As Important and Necessary As Administration to Protect Kansas.

The defendants argue at pages 45-56, 120 and elsewhere in their brief that, if delivery to Kansas is to be protected, Colorado uses must be placed under a definite and clear administrative restraint. It is of equal importance that no administrative regulation be adopted which will have the effect of compelling a curtailment of Colorado use and not assuring that a commensurate benefit will result in Kansas.

Kansas protests at great length that since Colorado is the upper state and has the first opportunity to use the water, it can deprive the Kansas area of all water unless appropriate restrictive measures are decreed. A proper consideration of the interstate equities requires recognition of the fact that water which flows out of the irrigated section of the basin is gone forever and cannot be turned around and brought back upstream. Shortage of water makes the elimination of waste imperative (*Burley Irrigation District v. Ickes*, 116 Fed. (2d) 529, 535). There is obviously no point in depriving the Colorado ditches of the right to use water unless there is reasonable assurance that such water will be used in Kansas. Once the water passes the Colorado headgates it is forever lost to them. Yet when such water which might be used to save a Colorado farmer's crop gets down into Kansas, it may not there be used either because of lack of development of land upon which it could be used, the fact of additional precipitation in Kansas making it unnecessary to be used, or the failure of the Kansas farmers to pay for irrigation projects, an attitude which they have assumed in the past.

This Court said in its 1907 decision (206 U. S. 109) that

"before * * * this effective cause of Colorado's development is destroyed or materially interfered with, it should be clear that such sister state has not merely some technical right, but also a right with a corresponding benefit." All that Kansas has attempted to show in this case is the same technical right which did not entitle it to relief in 1907. The Master's report clearly recognized (Findings of Fact, Paragraph Nine, Conclusions of Law, Paragraph Three), that the amount of water which he proposes to allocate to Kansas is not only for lands now being irrigated but also for lands to be irrigated in the future. A Court cannot bring about the irrigation of any lands by the mere entry of a decree any more than it can predetermine sovereign rights (see *U. S. v. Appalachian Electric Power Co.*, 311 U. S. 377, 423). Of necessity there can be no assurance that any additional lands whatsoever will be irrigated in Kansas no matter how great the curtailment of the existing Colorado uses; hence it is just as important to protect the Colorado uses from the wasting out of the irrigated area of water which the Colorado ditches could use as it is to protect the Kansas ditches from the alleged inequitable uses in Colorado. The evidence in this case shows that the protection of the Colorado uses is even more important. There has been no denial of the testimony of Colorado witness Patterson that in the period 1908 to 1938, 85,000 acre-feet of divertible water on an annual average flowed unused past Garden City. *Since Kansas is not now making full use of the resources which it has, there is no reason to expect that in the future it will use more water even if it gets it.*

IRRIGATION IN KANSAS.

The defendant's brief does not paint a true picture of irrigation in Kansas. At pages 21-22 there is a discussion of certain Kansas statutes allegedly providing for appropriative uses of water. No reference is made to the decision of the Kansas Supreme Court in the case of *Frizell v. Bindley*, 144 Kans. 84, 85 Pac. (2d) 95, wherein it was held that the Kansas statute of 1886 cannot be constitutionally applied in derogation of the common law riparian rights

attached to land patented prior to the enactment of the statute.

Attention is here directed to the following allegation made by Kansas in the former suit (206 U. S. 50-51):

> "That by the year 1868 the land in the Arkansas valley began to be taken by actual settlers, and by the year 1875 practically all the bottom lands in the east or lower half of the valley were entered and settled, and title obtained from the United States or the State of Kansas; and by the year 1882 the west or upper half of the valley was so entered and settled and like titles obtained."

Assuming as we must that the above quoted allegation by Kansas is true, the riparian and not the appropriation doctrine controls water uses in the Arkansas basin in Kansas. This conclusion would seem to be entirely supported by the record. No where is there any claim of an appropriation priority fixed by court decree or administrative permit. There was no administrative body to regulate irrigation in Kansas and no administration by any state water officials until 1933 (Tr. pp. 2646-2654, 5265-5271). There never has been any administration of the Syracuse or state line group of ditches (Tr. p. 5266). No records of ditch diversions in Kansas were kept until 1921 (Tr. p. 2670, 5266).

All these factors sustain our assertion that in Kansas irrigation is only of incidental or secondary importance.

The extent to which Kansas counsel would go to bolster their claims is shown by the assertion made on page 27 of their brief that in 1896 the Kansas irrigated acreage approximated 60,080 acres. This figure was obtained from certain unauthenticated pencil notes made on Kansas assessment records (Tr. p. 2702) and is inconsistent with all the other evidence in the case. At pages 108 to 111 of Appendix A to our opening brief we summarized the evidence describing the condition of the irrigation ditches and the extent of irrigation in western Kansas as assembled from testimony submitted by witnesses for the State of Kansas

in the former suit. Particular attention is again directed to statements that in 1895 little if any irrigation was then being accomplished; that the farmers were refusing to buy water and some were plowing up their irrigation laterals, while others instituted suit against the irrigation companies; that in the season of 1896 no attempt was made by the receiver to operate the Kansas ditches; that the services of the ditch superintendent were dispensed with; that the efforts of the receiver were directed solely to the sale of the ditches; and that in 1896 but one flood came down the river. Thus it is apparent that the claim asserted now, but not asserted in the original law suit, that there were over 60,000 acres irrigated in the basin in Kansas in 1896, constiutes another effort by Kansas to present a picture contrary to that presented in the former law suit in the hope of now obtaining relief which was then denied.

Indeed, the most serious and the most apparent switch in position has been the jump from the riparian to the appropriation theories of water law. In 1901 Kansas brought suit against Colorado upon the theory that Kansas was a riparian state. Now Kansas counsel assert that appropriation rights apply in western Kansas counties. To sustain their contention they cite Kansas statutes of 1868, 1885, 1886, and 1891 (Brief, pp. 21-22). *All of these statutes were in effect when the former suit was before this Court.*

THE 1916 SETTLEMENT.

The defendant's brief summarily disposes of the 1916 Settlement by asserting that neither the two states nor the defendant, The Finney County Water Users' Association, were a party to this contract (Brief, p. 32). There is no denial that the Colorado water users who signed that contract have lived up to their agreement by paying the money and performing the other obligations imposed upon them. One of two things is certain. Either the 1916 Settlement has an important bearing upon the determination of irrigation uses in the basin; or the Colorado water users were the victims of an enormous fraud.

As we argued in our opening brief, the 1916 Settlement must be considered along with the Kansas rotation agreement. The testimony of the witness Knapp, the official in charge of Kansas irrigation matters, is definite that he *would distribute any water allocated to Kansas in accordance with the rotation agreement* (Tr. p. 2667). This being the attitude of the responsible Kansas official a determination of the interstate equities requires consideration of the rotation agreement. It will be remembered that under this agreement the five Garden City ditches divide and rotate the water supply in accordance with a definite formula. All of these ditches participating in the rotation agreement, except the Farmers' ditch owned by the defendant, The Finney County Water Users' Association, were parties to the 1916 Settlement and by the terms of that settlement accepted a priority date of August 27, 1910, and the amounts of water therein specified as a definition of their rights against Colorado water users.

It is apparent from the testimony of Kansas engineer Knapp that if any additional water is secured in virtue of the rights of the Farmers' ditch, or in any other manner, he will distribute it under the rotation agreement. If this is done the four Kansas ditches who were parties to the 1916 Settlement will be securing benefits in direct violation of their solemn agreement with the Colorado water users. The Kansas ditches have not offered to return any of the consideration, approximately $150,000 (See App. A. p. 137), which they received from the Colorado water users. This is an equity case and fairness requires that before Kansas, who sues here either as *parens patriae* or trustee for its water users, can repudiate a solemn agreement made by its citizens and beneficiaries it must first offer to do equity. In private litigation a competent beneficiary cannot avoid a lawful agreement by acting through his trustee. States are said to have a temper superior to that of their citizens. States and state officials are presumed to be activated by legitimate motives. The attempted repudiation by Kansas of the 1916 Settlement does not

comport with that standard of conduct which should control interstate relations.

CADDOA RESERVOIR.

The contradictory Kansas attitude regarding Caddoa reservoir is bewildering and confusing. After joining in the 1933 Stipulation, which had as its underlying purpose the construction of Caddoa reservoir, and after its citizens and congressmen urged the building of the reservoir (See Colorado Brief, p. 91), Kansas asserts (Brief, p. 110) that by reason of the completion of the reservoir "substantially complete river depletion within Colorado will have become effective." In 1933 when the Stipulation was signed, in 1936 and 1938 when Caddoa was authorized and funds appropriated for its construction, Kansas made no claim that the project constituted any threat to it. Now, in 1943, realizing the weakness in its argument of increased stream depletion by Colorado and of injury to the substantial Kansas interests and desiring to have something upon which to base its claim for relief, Kansas reverses its position and shamelessly asserts that the reservoir, which it helped to secure, is a dangerous threat to it. This is but another of the many matters on which Kansas has changed its position.

In contrast to the Kansas attitude Colorado did not act to secure the construction of Caddoa by the United States until after the Stipulation was entered into and Colorado readily concedes that it solicited congressional support for the project and asserts that in so doing representations were made that the construction of the reservoir would afford a means for settling this serious controversy. Colorado does not repudiate the 1933 Stipulation. It will abide by its terms until this Court rules the agreement invalid.

After the assertion that the completion of Caddoa will effect a complete depletion of the stream by Colorado, there is this ambiguous paragraph found in the Kansas brief (pp. 113-114):

"The Caddoa reservoir belongs neither to Kansas nor Colorado. As a factor in this interstate water problem it will function on the same basis as every other reservoir constructed in Colorado in the Arkansas basin as a unit of regulation to capture surplus flood waters, and thereby complete in the most effective means possible the depletion of stream flow into Kansas. The capacity of the conservation pool, 385,000 acre-feet, represents its depletion possibility. Like the other 33 reservoirs in Colorado, with a storage capacity of 539,151 acre-feet, it represents purely an additional agency for depletion of water supply into Kansas. It is not an element which has any part in determining what equitable apportionment of the water supply should be adjudicated as belonging to the State of Kansas in her sovereign capacity. Only when a decree is entered, upon the basis of which delivery of water to Kansas can be compelled, does it enter this controversy, and then only as an agency along with other Colorado reservoirs or other Colorado sources of supply whereby replacement of water withheld from Kansas can be replaced in a practical and effective manner."

Frankly we are uncertain as to what this means. The idea that by conservation and storage in Caddoa reservoir Colorado can replace water withheld from Kansas is based upon two assumptions. First, that Colorado can use Caddoa for storage, and, second, that Colorado will withhold from Kansas water to which it is entitled.

There is one other idea expressed in the above paragraph from the Kansas brief which should be questioned. It is stated that Caddoa is an agency "along with other Colorado reservoirs" and can be used to replace water withheld from Kansas. Colorado, as a state, cannot compel the private individuals who own storage reservoirs in the Arkansas basin in Colorado to store water in their reservoirs for use in Kansas. Except for Caddoa,

every reservoir in the Colorado portion of the Arkansas basin is a private enterprise. The imposition of any requirement that one of these private enterprises should store water for use in Kansas would be a direct violation of either the Fifth or Fourteenth Amendments to the United States Constitution. Colorado water officials can refuse to permit unlawful diversions to these storage reservoirs. They cannot compel the storage of water therein against the wishes of the private owners.

In justification of the modifications which it seeks to the Master's recommendations Kansas says on pages 137-138 of its brief:

> "In the Caddoa channel reservoir alone a considerable portion of the flash floods hitherto passing across the state line will be impounded and controlled, and thus serve as a back log of water resource available to satisfy deliveries of water to Kansas as the same accrues. The Colorado administrative authorities will find that the amount credited for delivery to Kansas can be satisfied from water originating or impounded lower down on the stream, thus permitting their full use of such water as might pass the index stations."

Apparently Kansas' position is that it wants to have nothing whatever to do with Caddoa. It denies all interest in the reservoir and presents it as a Colorado problem which is first a threat and second a means of satisfying the Kansas demands. If the Kansas intent is to relinquish all rights to Caddoa reservoir, Colorado will accept the responsibility of endeavoring to work out with the Corps of Engineers a program for the most beneficial use of the conservation facilities of this reservoir. In offering to assume such responsibility Colorado points out that the record contains no evidence which even tends to prove that by the use of the storage facilities of Caddoa reservoir either the apportionment recommended by the Master, or

the highly exaggerated apportionment sought by the Kansas exceptions, can possibly be met without the curtailment of existing Colorado uses. To the contrary, Colorado says flatly that, if such a study were made, the result would prove the necessity for substantial reductions of Colorado diversions even though Caddoa were utilized in the most efficient manner. If the extreme modifications sought by Kansas were to be given effect, Caddoa storage would be woefully insufficient to satisfy the Kansas requirements without extreme curtailment of Colorado uses.

It must be recognized that the estimated life of Caddoa is about sixty years. Kansas recognizes this on page 109 of its brief. It is thus apparent that any decree based upon the use of Caddoa as a means of satisfying Kansas requirements would become outmoded with the progressive siltation of the reservoir.

A fair and equitable treatment of Caddoa is that contained in the 1933 Stipulation which provides that the benefits of conservation storage shall be divided equally between the two states. One of the purposes of the presentation of Colorado Operation Plan F was to show that this could be accomplished.

Finally in connection with Caddoa it should be pointed out that Kansas seeks to leave the impression that this channel reservoir affords a means of cutting out all state line flows to Kansas. On page 110 of its brief the flat statement is made that the state line flows may be "reduced to a few flash floods which might join the river flow in the 50-mile strip to the state line." Inconsistently Kansas admits (Brief p. 111) that the water produced below the reservoir cannot be controlled in any way by this reservoir. Attention is directed to the fact that between Caddoa and the state line there is a drainage area of 5,790 square miles tributary to the main river (See Colo. Ex. 205, App. B, p. 59). To clarify the matter we repeat here Table 32 found on page 147 of Appendix A:

TABLE 32

Average Discharge of Arkansas River At Caddoa and at Stateline

Diversions and Accretions Along River Section

(Values in Acre-Feet Are Averages for 1908-1938)

	Summer	Winter	Annual
Flow at Caddoa	233,100	62,600	295,700
Diversions of Colorado Ditches	117,800	41,100	158,900(a)
Balance—Undiverted	115,300	21,500	136,800
Accretions to Section	65,200	58,700	123,900(b)
Flow at Stateline	180,400	80,300	260,700

(a) Comparable with 160,000 acre-feet specified in 1933 Stipulation.
(b) Accretions below Caddoa constitute about ½ of total State line flow.

In the above table it is seen that approximately half of the historical state line flows originate below Caddoa. No storage of water in Caddoa can have any effect on such flows. These flows will in the future be increased as the use of Caddoa for conservation storage permits greater diversions by the Colorado ditches below Caddoa or by the Fort Lyon Canal System.

The benefits possible of achievement through conservation storage in Caddoa are discussed in our Appendix A, p. 145 *et seq.*

The situation with respect to Caddoa may be summed up by saying that it is neither the threat nor the cure-all which Kansas suggests but rather that it is an important factor which must be utilized to the fullest extent possible in any equitable apportionment made between the two states determining rights to the use of Arkansas river water.

MISCELLANEOUS MATTERS APPEARING IN THE DEFENDANTS' BRIEF WHICH ARE DISPUTED BY COLORADO.

In addition to the many matters heretofore discussed there are numerous minor details with which Colorado disagrees with the defendants. In order that there may be no mistake in our position we shall briefly direct attention to some of these.

On pages 14 and 15 Kansas copies Paragraph Second of the Master's Findings of Fact. Therein it is stated that the area of the Arkansas drainage basin in Colorado is 25,258 square miles and in Kansas 18,238 square miles. We say that the Colorado drainage area is 24,628 square miles and the Kansas drainage area 22,195 square miles. (See Colo. Ex. 205, App. B, p. 59, and App. A, p. 53). It might be observed in passing that in the former case this Court held that the drainage area of the Arkansas river in Colorado was 26,000 square miles and in Kansas 20,000 square miles (206 U. S. 105).

In the same paragraph from the Master's Findings it is stated that the elevation of the river at Canon City is about 4,900 feet. The correct figure, as shown on page 4 of Colorado's opening brief, is 5,363 feet.

The same paragraph in the Master's Findings quoted by Kansas gives the distance from the headwater branches to Canon City as 100 miles. Actually, as shown in Appendix A, page 54, the length is 130 miles. On page 17 of the Kansas brief it is stated that Larned is approximately 190 miles east of the state line or 230 miles by river channel and also about 100 miles above the point where the river crosses the Kansas-Oklahoma line. We say that the facts are that Larned is approximately 195 miles by river channel below the Colorado-Kansas line and approximately 195 miles above the Kansas-Oklahoma line.

At numerous places, for example, page 17, the Kansas brief states that the precipitation in the Colorado mountains runs from 20 to 30 inches annually. While it may be

true that precipitation on the higher mountain peaks and ranges may approximate 20 to 30 inches annually, it is also true, as indicated in the Colorado brief at page 4 and the precipitation map appearing in Appendix B, page 52, that the total precipitation in the valleys in the mountains is approximately 10 to 12 inches annually. An examination of the aforesaid precipitation map (Colo. Ex. 202) shows that the average annual precipitation at Buena Vista is 10.08 and at Salida 12.20. Both of these weather bureau stations are located in the mountains. For a description of the precipitation in the limited high mountain areas, we refer to our statement at page 54 of Appendix A.

On page 18 of the Kansas brief the statement is made that the region along the Arkansas river in western Kansas and Colorado is placed by the United States Government in its classification of land areas in the arid or irrigation section. In connection with such matters the United States Government operates through various agencies and departments. We know of no federal agency that has made the alleged classification. On the contrary the United States Census Bureau specifically classifies the State of Colorado as being one of the so-called arid states and specifically classifies the State of Kansas as being one of the sub-humid or semi-arid states. This matter is not of material importance. A complete and accurate description of precipitation as affecting the need for irrigation is found at pages 57 and 58 of our Appendix A.

The citation from the Master's report found at page 19 of the Kansas brief regarding temperature and wind movement being higher in western Kansas than in eastern Colorado is apparently intended to lay the foundation for claims later advanced to the effect that need for irrigation in western Kansas is the same as in eastern Colorado. Although counsel for Kansas have repeatedly made this assertion, it should be recalled that the Kansas witness Meeker specifically testified to the contrary. He submitted Kansas Exhibit 93 which shows that the irriga-

tion requirements on the land, so-called economic use of water, approximates 1.2 acre-feet per acre in eastern Colorado and approximates .8 acre-feet per acre at Garden City, Kansas. Likewise attention is directed to the fact that Colorado Exhibit 135 (App. B, p. 27), an excerpt from United States Department of Agriculture Technical Bulletin No. 36, shows the seasonal net irrigation requirement in acre-feet per acre to be 2.10 acre-feet per acre in south central Colorado, 2.30 acre-feet per acre in southeastern Colorado and 1.75 acre-feet in western Kansas. *Thus the theory of Kansas counsel is contrary not only to the testimony of their witness but also the findings of an impartial federal department.*

A statement appears at page 27 of the Kansas brief that the irrigation census of 1902 reported 212,341 acres irrigated in the Colorado counties of Pueblo, Otero, Crowley, Bent, and Prowers. The special irrigation census of 1902, although it reported total irrigated areas in the various states subdivided by stream basins, made no further segregations of the totals by counties and did not report the figure as alleged above.

On page 27 of the Kansas brief the statement is made that in the section between the state line and Garden City there is an area of only 29,239 acres in which irrigation is maintained without the use of supplemental water secured from pumping plants. Actually the record shows that the development of supplemental water supplies by means of wells and pumps has progressed in Kansas to the point that the irrigation commissioner for the state recommends to the water users that pump irrigation is more effective and cheaper than surface irrigation when control of stream flows by means of reservoirs is a necessary part of the surface irrigation program (See App. A, pp. 104-108). While it is true that increased acreages of irrigated land under the ditches of western Kansas are being served with supplemental supplies by means of wells and pumps, that development must be considered in the light of accom-

panying developments such as increased acreages of more valuable crops being planted today than at the time of the former suit. For example, sugar beets are planted and harvested each year upon a substantial portion of the irrigated acreage in the western Kansas Counties;[14] whereas at the time of the former suit none of the acreage was devoted to such a crop. In opposition to the argument advanced by the counsel for Kansas it should be said that Kansas has only recently undertaken to develop her locally available underground water resources and, having done so, is now largely independent of stream flows received from Colorado.

On page 29 the Kansas brief characterizes the mountain runoff as "impounded in those regions until released for use in the late spring and early summer". This is a grossly misleading statement. It implies practically a situation equivalent to reservoir storage. Colorado, of course, has no control whatsoever over the climatic conditions which determine when and how rapidly the mountain snow banks will melt.

MEMORANDUM OF THE UNITED STATES.

A memorandum has been filed by the United States as *amicus curiae* suggesting that the Recommended Decree of the Master be so modified as to eliminate language stating that the states are each the owner of the respective amounts of water apportioned. The memorandum proposes that this be done by the elimination of the words "the owner and" in Paragraphs One and Two of the Recommended Decree. The reason assigned is that the approval of such language by this Court might constitute a prejudging of the question of ownership which, though not an issue in this case, is a vital issue in the North Platte river case. *(Nebraska v. Wyoming and Colorado, United State Intervener,* Original No. 7). As we have heretofore

---

[14] It appears from the report of Kansas irrigation commissioner Knapp that in the biennium 1920-1922, in the irrigated area between Dodge City and the state line there were 5,000—10,000 acres of sugar beets and some truck crops (Tr. pp. 1836-1837).

indicated at pages 96-97 of our opening brief we concur in the suggestion that the question of ownership should properly await decision in the North Platte case.

CONCLUSION.

For the second time in this century Colorado is before this Court to protect that portion of its domain which is dependent upon the waters of the Arkansas for the support of human life and endeavor. The first controversy between Colorado and Kansas ended thirty-six years ago with a decision which Colorado has always accepted as binding upon it. In the years that passed between that decision and the filing of this case, the individual Colorado water users were subjected to continuing and persistent attacks by Kansas water users. The Colorado people sought by concessions, agreements and money payments to secure peace. In these efforts they failed. To end disturbing private controversies, Colorado availed itself of the only possible remedy, a suit in this Court.

In presenting its cause for determination Colorado relies upon the 1907 decision as a binding determination that it was not then, by its water uses, exceeding its equitable share and says that since then it has done nothing to destroy the equitable apportionment between the two states of rights of use of Arkansas river water.

In opposing Colorado, Kansas presents legal arguments inconsistent with its arguments in 1907, asserts factual situations utterly different from those presented in the Kansas pleadings and discussed in the Court's opinion in 1907, repudiates agreements made by its citizens, and ignores a stipulation signed by its high officials. Such tactics are employed for the admitted purpose of securing water for land which was not irrigated at the time of the former case, is not irrigated now, and may never be irrigated even though existing Colorado uses are curtailed in order to increase the state line flows.

Colorado most sincerely desires peace with Kansas.

The price of peace should not be the destruction of a long established, successful and socially valuable economic development.

Respectfully submitted,

GAIL L. IRELAND,
Attorney General of the State of Colorado,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,
Special Counsel for Complainant.

Denver, Colorado,
September 27, 1943.

APPENDIX C.

A CRITICAL ANALYSIS OF THE EVIDENCE OF THE KANSAS WITNESS MEEKER PURPORTING TO SHOW STREAM DEPLETION BY COLORADO.

Under the heading of the principle of law controlling this case the argument is made, at page 46 of the Kansas Brief that the Master's finding of a material increase in the depletion of the river by Colorado since the original *Kansas v. Colorado* case is adequately supported by comparing the years of similar water supply and by evidence that since the close of testimony in that case consumption of water in Colorado has increased to the extent of 300,000 acre-feet of the average yearly dependable water supply. With respect to these alleged showings we have prepared certain tables which demonstrate the inconsistency of the quantities assumed or estimated by the witness Meeker upon which the entire showing of Kansas, in this connection, is based. Two different methods of demonstrating the inconsistency of the assumed values are submitted. One is to show how the assumed water production over the foothill and plains areas below Canon City compares with the annual average precipitation at stations scattered over that drainage area. This information is summarized in Tables 1 and 1(a). The second comparison, shown in Tables 2 and 2(a) shows the relations between the plains water production and the average annual precipitation. In each instance the water production figures are taken from Kansas Exhibits and the records of precipitation are taken from United States Weather Bureau reports.

In Table 1, we have selected the first ten years of the period employed by the witness Meeker in behalf of Kansas, namely, the period from 1895 to 1930 and have compared those years with the last ten years of the period, in each instance having excluded the so-called flood years of 1900 and 1905, in the early period, and of 1921 and 1923, in the recent period. The total production of water in the entire basin in Colorado as estimated or assumed by the witness Meeker is shown in column 2 of Table 1, and is taken from Kansas Exhibit 62. Production of water above

Canon City is shown in column 3, being values taken from various Kansas exhibits which correct the recorded flows at Canon City according to the quantities of water bypassed around the station, imported from other stream systems, withheld and released from upstream reservoirs, and consumed by the irrigation of lands along the river and its tributaries upstream from Canon City. The difference between columns 2 and 3, being the value shown in column 4, therefore, represents the amount of water assumed to have been produced in that portion of the drainage basin below Canon City. In column 5 are shown the annual amounts of precipitation at a group of United States Weather Bureau stations scattered over the drainage area.

Although the precipitation over the drainage area below Canon City during the first ten years of the study period was somewhat greater than the precipitation at the same stations during the last ten years of the study period, the witness Meeker assumes that the production of water over the drainage area below Canon City was greater by 250,200 acre-feet per year in the recent period. Manifestly, precipitation is the sole source of runoff. While there might be variations in the amounts of the precipitation which accumulate in stream channels, according to the intensity of the individual rain storms, such differences are eliminated, when groups of several years are compared, as in Table 1, for the reason that the character of the rainfall was identical, when considered as averages, in both of the periods. In order to bring out the inconsistencies of the Meeker assumptions, as to runoff from the drainage area below Canon City, Table 1(a) has been prepared in which the amounts of precipitation over the area below Canon City are arranged in the order of their magnitude. Right hand columns show the years and the assumed quantities of water produced in those years, whereas the left hand columns relate to the early period from 1896 to 1906. On the average the assumptions as to water production during the early period were some 250,000 acre-feet less than during the recent period, in each of which the amounts of precipitation were substantially the same. One of the most

flagrant cases of erroneous assumption appears in the record of 1906. As shown by the cross examination concerning the estimates of that year, at pages 2099-2106 of the transcript, the witness admits that he paid no attention to precipitation records, and in connection with the year 1906 admits that he assumed a small total water production even though all of the records of stream flows, both of the main river and all tributaries, and all the precipitation records showed that they were above average during that year.

A second way to present the same comparative data, and to indicate the inconsistencies in the Meeker assumptions, are shown in Tables 2 and 2(a). In this instance the natural flow at Canon City has been taken from Kansas Exhibit 25. Here the recorded flows have been corrected by the witness Meeker for bypassed, imported and stored waters. It will be recalled that the flow at Canon City purports to show 64% of the total mountain runoff. This relation comes from the ratio of 595,000 acre-feet to the total mountain runoff figure of 930,000 acre-feet. Assuming that the figures in column 2 represent 64% of the total mountain runoff, those in column 3 represent all or 100% of the mountain runoff, according to the witness Meeker. Comparing these values with the ones shown in column 4 which are his claimed total water production figures, per Kansas Exhibit 70, the differences are necessarily his assumed or estimated values for plains runoff. These are shown in column 5. It will be noted that in three of the years of the early period the total basin production is less than the calculated mountain water supplies. In other words Mr. Meeker has assumed that the runoff from the plains area in those three years was a minus value. As will be noted from column 6 showing the average precipitation below Canon City, Mr. Meeker assumes values for the plains runoff in the early period averaging 124,500 acre-feet, at a time when precipitation averaged 15.42 inches, whereas for the recent period, and from a lower average annual precipitation, he estimates the plains runoff at 352,700 acre-feet or 228,200 acre-feet more than was estimated

for the early period even though the rainfall of the early period was larger in amount.

The same information contained in Table 2 is shown in a different arrangement on Table 2(a). For example in the year 1925 when the average precipitation over the plains area was 13.90 inches Mr. Meeker estimates the plains water production at 423,000 acre-feet. In years of the early period when precipitation was comparable in amount he estimates plains runoff at 73,000 acre-feet as in 1896 or 53,000 acre-feet as in 1901. Again comparing his estimate of 287,000 acre-feet of plains runoff in 1920, when precipitation was 14.55 inches, he estimates that the plains runoff in 1899 was a minus 104,000 acre-feet. As compared with estimates of 418,000 acre-feet in 1929 and 535,000 acre-feet in 1927, when the rainfall approximated 15.87 inches, Mr. Meeker assumes that in earlier years when the rainfall was comparable, the plains runoff was minus 72,000 acre-feet as in 1897, or was 106,000 acre-feet as in 1898. Comparing the years when rainfall was largest Mr. Meeker says that the plains runoff in 1928 was 469,000 acre-feet, the precipitation for that year averaged 17.23 inches, whereas for the year 1906, when the precipitation averaged 17.50 inches his figures purport to show that the plains runoff was a minus 41,000 acre-feet.

Having set up estimates of total water production, which include the extremely low and inconsistent values noted for the years of the earlier period, the counsel for Kansas then attempt to make comparisons of the amounts of State line flow comparing years when he says the total water production was the same. The fact is, as indicated above, that the Kansas counsel are not comparing years of equal water production.

TABLE 1

WATER PRODUCTION BELOW CANON CITY PER KANSAS EXHIBITS COMPARED WITH PRECIPITATION PER U. S. W. B. RECORDS

(1) Year	(2) Total Production Basin in Colorado	(3) Production Above Canon City	(4) Production Below Canon City	(5) Average Precipitation Below Canon City
1895	1,200.000	682,000	518,000	16.79
1896	720,000	459,000	261,000	13.22
1897	750,000	571,000	179,000	15.49
1898	900,000	553,000	347,000	15.88
1899	990,000	745,000	245,000	14.26
1901	820,000	537,000	283,000	14.22
1902	750,000	328,000	422,000	14.87
1903	1,020,000	559,000	461,000	14.82
1904	1,200,000	497,000	703,000	17.12
1906	990,000	710,000	280,000	17.50
Avge.-A	934,000	564,100	369,900	15.42
1919	1,270,000	695,350	674,650	16.72
1920	1,370,000	758,440	611,560	14.55
1922	970,000	562,910	407,090	13.19
1924	1,220,000	665,850	554,150	10.55
1925	1,100,000	476,940	623,060	13.90
1926	1,110,000	599,050	510,950	13.04
1927	1,510,000	678,820	831,180	15.87
1928	1,360,000	619,750	740,250	17.23
1929	1,410,000	692,640	717,360	15.60
1930	1,170,000	539,100	630,900	16.83
Avge.-B	1,249,000	628,900	620,100	14.75

A—First 10 years, exclusive of 1900 and 1905.

B—Last 10-years, exclusive of 1921 and 1923.

(2)—Per Kansas Exhibit 62.

(3)—From Kansas Exhibits 18, 20, 23, 24, 59 and 135.

(4)—Difference between Col. (2) and Col. (3).

(5)—Precipitation (inches annually) averaged for Stations: Canon City, Cheyenne Wells, Colorado Springs, Holly, Lake Moraine, Lamar, Las Animas, Limon, Pueblo, Rocky Ford, Trinidad and Two Buttes.

(Lake Moraine included because it is in headwater area of Beaver Creek and Fountain Creek.)

The above precipitation figures are taken from the publication of the United States Department of Agriculture, Weather Bureau, entitled "Climatic Summary of the United States—Climatic Data herein from Establishment of Stations to 1930, Inclusive—Section 24—Southeastern Colorado," pages 24-7 to 24-15.

TABLE 1(a)

WATER PRODUCTION BELOW CANON CITY PER KANSAS EXHIBITS COMPARED WITH PRECIPITATION PER U. S. W. B. RECORDS

EARLY PERIOD				RECENT PERIOD	
Year	Acre-Feet	Precipitation Below Canon City		Acre-Feet	Year
			10.55	554,150	1924
			13.04	510,950	1926
			13.19	407,090	1922
1896	261,000	13.22			
			13.90	623,060	1925
1901	283,000	14.22			
1899	347,000	14.26			
			14.55	611,560	1920
1903	461,000	14.82			
1902	422,000	14.87			
1897	179,000	15.49			
			15.60	717,360	1929
			15.87	831,180	1927
1898	347,000	15.88			
			16.72	674,650	1919
1895	518,000	16.79			
			16.83	630,900	1930
1904	730,000	17.12			
			17.23	740,250	1928
1906*	280,000	17.50			
Avge.-A	369,900	15.42	14.75	620,100	Avge.-B

*See Tr, pp. 2099-2106 for cross-examination year 1906.

TABLE 2

PLAINS WATER PRODUCTION PER KANSAS EXHIBITS COMPARED WITH PRECIPITATION PER U. S. WEATHER BUREAU RECORDS

(1) Year	(2) Natural Flow at Canon City	(3) Total Mountain Water Production	(4) Total Production Basin in Colorado	(5) Balance Computed Plains Production	(6) Average Precipitation Below Canon City
1895	636,000	994,000	1,200,000	206,000	16.79
1896	414,000	647,000	720,000	73,000	13.22
1897	526,000	822,000	750,000	- 72,000*	15.49
1898	508,000	794,000	900,000	106,000	15.88
1899	700,000	1,094,000	990,000	-104,000*	14.26
1901	491,000	767,000	820,000	53,000	14.22
1902	284,000	444,000	750,000	306,000	14.87
1903	512,000	800,000	1,020,000	220,000	14.82
1904	449,000	702,000	1,200,000	498,000	17.12
1906	660,000	1,031,000	990,000	- 41,000*	17.50
Avge.-A	518,000	809,500	934,000	124,500	15.42
1919	635,000	992,000	1,270,000	278,000	16.72
1920	693,000	1,083,000	1,370,000	287,000	14.55
1922	508,000	794,000	970,000	176,000	13.19
1924	605,000	945,000	1,220,000	275,000	10.55
1925	433,000	677,000	1,100,000	423,000	13.90
1926	544,000	850,000	1,110,000	260,000	13.04
1927	624,000	975,000	1,510,000	535,000	15.87
1928	570,000	891,000	1,360,000	469,000	17.23
1929	635,000	992,000	1,410,000	418,000	15.60
1930	489,000	764,000	1,170,000	406,000	16.83
Avge.-B	573,600	896,300	1,249,000	352,700	14.75

A —First 10 years, exclusive of 1900 and 1905.

B —Last 10 years, exclusive of 1921 and 1923.

(2)—Per Kansas Exhibit 25.

(3)—Calculated Col. 2, divided by 64% (Ratio 595,000:930,000).

(4)—Per Kansas Exhibit 70.

(5)—Difference Col. (4) minus Col. (3).

(6)—Precipitation (inches annually) averaged for stations: Canon City, Cheyenne Wells, Colorado Springs, Holly, Lake Moraine, Lamar, Las Animas, Limon, Pueblo, Rocky Ford, Trinidad, and Two Buttes. Values taken from same source as indicated on Table 1 *supra*.

(Lake Moraine included because it is in headwater area of Beaver Creek and Fountain Creek.)

*Years when total basin production less than mountain production.

TABLE 2(a)

PLAINS WATER PRODUCTION PER KANSAS EXHIBITS COMPARED WITH PRECIPITATION PER U. S. WEATHER BUREAU RECORDS

EARLY PERIOD		Precipitation Over Plains Region		RECENT PERIOD	
Year	Acre-Feet			Acre-Feet	Year
			10.55	275,000	1924
			13.04	260,000	1926
			13.19	176,000	1922
1896	73,000	13.22			
			13.90	423,000	1925
1901	53,000	14.22			
1899	-104,000*	14.26			
			14.55	287,000	1920
1903	220,000	14.82			
1902	306,000	14.87			
1897	- 72,000*	15.49			
			15.60	418,000	1929
			15.87	535,000	1927
1898	106,000	15.88			
			16.72	278,000	1919
1895	206,000	16.79			
			16.83	406,000	1930
1904	498,000	17.12			
			17.23	469,000	1928
1906	- 41,000*	17.50			
Avge.-A	124,500	15.42	14.75	352,700	Avge.-B

*Indicates seasons when plains runoff assumed at the minus amounts shown.

ABSTRACT OF TESTIMONY OF R. I. MEEKER, CROSS-EXAMINATION, TRANSCRIPT PAGES 2099-2106 CONCERNING THE YEAR 1906.

Q. What character of water-supply year do you find 1906 to be, according to your method of determining?

A. A 80 percent year, according to the total water supply of the basin.

Q. The way of arriving at that is the ratio between your estimated total water supply of 990,000 acre-feet in 1906 compared with the average annual total water supply of 1,240,000 acre-feet?

A. That is the ratio.

Q. According to your Exhibit 18, the recorded stream flow at Canon City in 1906 was 605,000 acre-feet, was it not?

A. That is correct.

Q. Comparing this to the mean for that station, of 550,000 acre-feet, indicates the main stem mountain runoff was 110%, or 10% above normal?

A. Correcting for the ditch diversion shown in Kansas Exhibit 25 it checks out 112%.

Q. The annual flow corrected was 660,000 acre-feet, according to Exhibit 25?

A. Yes, sir.

Q. As compared to the average, computed on this basis, of 595,000 acre-feet, the runoff from the mountains above Canon City was 111% or 11% above normal?

A. That is true.

Q. The only other record evidence relating to mountain water supply, found among your exhibits, other than the main river at Canon City, is Exhibit 29, showing the discharge of West Beaver Creek in 1906 to have been 17,234 acre-feet?

A. That is true on the tributaries.

Q. This West Beaver Creek record for 1906 compared to the average of 13,785 acre-feet, indicates that portion of the mountain supply was 125%, or 25% above normal?

A. That is true.

Q. Have you any other record evidence as to the probable mountain water supply in the year 1906?

A. That is all of the measured runoff.

Q. Now, turn to the plains or tributary water supply: have you any record evidence of its character, other than that of the records of precipitation?

A. The only record I have, is the outflow at the Kansas

State line for that year, plus the consumptive use, which gives the gross quantity.

• • • • •

The records of precipitation, being official records of the United States Weather Bureau show that the rainfall in 1906 compared with normal amounts of annual precipitation as follows, each of which values were admitted by the witness Meeker:

	1906	Normal
Colorado Springs	16.95	14.46
Canon City	15.62	12.64
Pueblo	11.00	11.56
Trinidad	16.77	17.03
Rocky Ford	14.66	12.39
Hamps	19.07	14.35
Las Animas	16.95	12.29
Lamar	19.83	15.56
Holly	15.65	14.67
Cheyenne Wells	19.37	17.18
Two Buttes	18.44	15.35
Averages	16.75(a)	14.31(b)

(a) If the Lake Moraine station was added to the list of eleven stations the average would be 17.50 inches instead of 16.75. (Precipitation at Lake Moraine in 1906 was 25.63 inches.)

(b) Normals are from the 1922 Climatic Summary of the U. S. Weather Bureau, Section 7, Southeastern Colorado. Normal for Lake Moraine is shown in that summary to be 24.75 inches. Normal for 12 stations including Lake Moraine would be 15.19 inches instead of 14.31 inches.

• • • • •

Q. So that of the eleven precipitation records scattered over the plains area, only two, Pueblo and Trinidid, received less than normal rainfall in 1906?

A. I believe that is the situation.

Q. The average of the whole group would show the year to have received 16.75 inches of precipitation which (as compared to the average of 14.31 inches) is about 115% of normal, would it not?

A. That is substantially correct.

Q. Now does not this situation arise: that you have deduced a water supply for 1906, which is about 20% below average, during a year when the mountain water supply,

as reported, was about 12% above average, and the rainfall over the plains area was about 15% above normal?

A. That is true.

The questions and answers, at pages 2104 and following, may be summarized somewhat as follows:

If all of the mountain runoff be assumed at 11% or 12% above average, as indicated for the main river by the record at Canon City at 111%, and as indicated for mountain tributaries by West Divide Creek at 125%, then the item of total mountain runoff in 1906 would be about 1,055,000 acre-feet. Since this mountain runoff exceeds the total water supply of the entire basin for the year 1906 of 990,000 acre-feet, as shown by Kansas Exhibit 70, the method of calculating the total water supply of the year amounts, in fact, to assuming that the plains supply was a minus value—a conclusion that manifestly is also erroneous, for such a condition is impossible. If the plains runoff had been estimated at the same amount, in relation to average annual plains runoff, as indicated by the relations between 1906 and normal precipitation then the plains runoff would have approximated 400,000 acre-feet in the year 1906. This added to the previously calculated mountain runoff of 1,055,000 acre-feet would have given an indicated total for 1906 of 1,455,000 acre-feet. Mr. Meeker attempts to prove that such an assumption as to the total water supply of the basin in 1906, would be inaccurate, by subtracting the total State line outflow of 260,000 acre-feet from the deduced figure of 1,455,000 acre-feet leaving a balance of 1,195,000 acre-feet which would constitute the consumption of water in Colorado during the year 1906. His analytical study (which is merely a multiplication of an irrigated acreage by an assumed rate per acre) shows a water consumption of only 730,000 acre-feet, or 465,000 acre-feet less than the total consumption as above calculated. Mr. Meeker says that when the indicated total consumption of 1,195,000 acre-feet is evaluated as against the 383,000 acres of land irrigated in 1906, the unit rate of consumptive use would

be 3.1 acre-feet per acre. He says that such a rate is not confirmed or supported by any information available to him.

He admits, however, (page 2107) that his calculations for the year 1914 showed a water consumption per acre irrigated in Colorado of 2.85 acre-feet per acre, so that it would not have been impossible for the consumption, in 1906, to have been as much as the indicated 3.1 acre-feet per acre, and yet for this year of 1906 Mr. Meeker prefers to assume a figure of 1.64 acre-feet per acre and thus to arrive at a figure of total water consumption in Colorado, which is wholly inconsistent with all available records, including the recorded flows of the Arkansas River at Canon City, the records of mountain tributaries (to the limited extent that such records were available), and the records as to rainfall over the plains drainage area, concerning which there were no records of tributary runoff.

Manifestly by such a method of initial assumption anything can be proven that might in advance be thought advisable.

Mr. Meeker attempts to defend his assumed rate as opposed to the foregoing calculated rate of consumptive use on the ground that his Exhibit 67, showing the curve of reservoir capacity indicates that a large capacity, about 300,000 acre-feet, was imposed on the river about 1912. This curve of so-called reservoir capacity, itself is of questionable accuracy. The point, however, at this time is that the effects of reservoirs along the Arkansas River were taken into account during the period of so-called analytical study from 1912 to 1930, but were wholly ignored during the period from 1895 to 1911. In other words, during the period 1912 to 1930 the resulting figures of consumptive use as calculated by the witness Meeker, include the effects of (a) agricultural consumption; (b) reservoir operations; and (c) ground water storage. However, his assumed values for consumptive use during the earlier period are based on estimates of agricultural consumption and wholly ignore the other two factors. Not only was storage a material factor in 1906 and in years prior thereto, but the matter

of ground water storage was a much greater factor during the early period of 1895 to 1911 than it has been during the recent period from 1912 to 1930. For this reason the rates of consumptive use during the early period would necessarily be materially greater than those of the recent period, if the factor of ground water storage had been taken into account.

TESTIMONY CONCERNING THE YEAR 1914—
TRANSCRIPT PAGES 2109-2110.

As has been heretofore indicated, by tables 1 and 2, and by the previous discussion of the records concerning the year 1906, the assumed or estimated values as to water production and water consumption in Colorado during the early period 1895 to 1911 were consistently low or too small. At the same time the estimates of water production and water consumption during the recent period 1912 to 1930, in general, are greater than investigators for Colorado feel that they should be. For example the records for the year 1914 referred to several times by the witness Meeker, show that the mountain runoff, based on the water supply at Canon City, was 130%, or 30% above normal. Official records of the United States Weather Bureau show that precipitation over the plains area in Colorado during 1914 was 126% of normal. Assuming that the mountain and plains runoff varied from normal in direct proportion to the recorded amounts of stream flow and plains precipitation, the total water supply of the season of 1914 would be 1,660,000 acre-feet. The total water supply as estimated or deduced by Mr. Meeker in 1914 was 1,960,000 acre-feet, or 300,000 acre-feet more than arrived at by the computations based directly upon the recorded stream flows and amounts of precipitation. Because the estimated amounts of total water production and total water consumption in Colorado were believed by Colorado to be too high in the recent years, and too low in the early years, as calculated by Mr. Meeker, no serious objection has been made by Colorado as to his estimated average annual water supply. However, the fact that the estimates were consistently too low in the early years and were too high in some of the

recent years (as indicated by the year 1914), permits of the claim advanced by the State of Kansas, of increased depletions in Colorado, to which the State of Colorado strenuously objects.

FILE COPY

No. 5—Original

In the Supreme Court of the United States

OCTOBER TERM, 1941

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

Defendants' Exceptions to Report and Recommendations of Special Master

A. B. MITCHELL,
Attorney General of Kansas,
Topeka, Kansas,

ELDON WALLINGFORD,
Assistant Attorney General,
Topeka, Kansas,

W. E. STANLEY,
First National Bank Building,
Wichita, Kansas,
Attorneys for the State of Kansas.

W. E. STANLEY,
Attorney for the Finney County Water Users' Association, a Corporation.

In the Supreme Court
of the United States

OCTOBER TERM, 1941

THE STATE OF COLORADO, *Complainant,*

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants.*

No. 5—Original

Defendants' Exceptions to Report and Recommendations of Special Master

---

The State of Kansas and The Finney County Water Users' Association, defendants above named, pursuant to the order of this Court herewith submit their exceptions to the report of Special Master Charles C. Cavanah filed in this cause on May 24, 1943, and set forth said exceptions in the following particulars, to wit:

I

Defendants except to the last paragraph of the Special Master's second finding of fact, and move the court to substitute in lieu thereof the following:

The general character of the River and the

valley, and the country adjoining, are practically uniform from the point where the River emerges from the Rocky Mountains to a point about 200 miles east of the western border of Kansas, *except that in that portion of the River and valley lying in Kansas, there are no entering tributaries except for a few small dry arroyas.* The lands in Kansas attempting to practice irrigation are dependent upon the flow of the Arkansas River which comes into Kansas from Colorado.

Such addition is suggested for the reason that the finding as submitted by the Master is incomplete, since the undisputed evidence shows that there are no tributaries which enter the River in Kansas from the state line east to the mouth of the Pawnee, approximately 190 miles east of the state line.

NOTE.—For the sake of clarity throughout these exceptions, the original text of the Master's report is set out in ordinary type. Wherever new words or phrases are substituted, the same have been italicized, and language objected to in the Master's report has a line drawn through it, thus enabling the court to have before it in the exceptions, the exact changes which are requested.

II

Defendants except to that portion of the first paragraph of the third finding of fact, and move the court

to strike therefrom the phrase contained in said report, which appears in lines 4 and 5 on page 7 thereof, to wit:

> and which increases gradually from Pueblo, Colorado, to Dodge City, Kansas,

so that the sentence will read as follows:

> The tributaries to the River contribute water in measurable quantities which is due to rainfall, surface runoff and seepage return water from irrigation, and in some instances from melting snows in the mountains, ~~and which increases gradually from Pueblo, Colorado to Dodge City, Kansas~~.

for the reason that the finding of the Master as stated is ambiguous and is contrary to the record, in that the undisputed evidence shows there are no tributaries entering the River and no contributions therefrom from the state line to Dodge City.

III

Defendants except to the second paragraph of the third finding of fact, and move the court to substitute in lieu thereof the following:

> There are periodical flood flows of unusable waters ~~of summer seasons~~ flowing in the River and continuing at times for several hours to several days, which consist of sudden melting of snows in the mountain area and rainfall in the plains area, ~~and can and are~~ *which have been* to some extent captured and conserved by ~~small~~ reservoirs *constructed prior to 1920*, ~~and the in-~~

~~completed Caddoa dam and reservoir.~~ *and with the construction of the channel reservoir known as the Caddoa Reservoir now completed to the extent of storage of 270,000 acre feet, and with ultimate storage capacity of 655,000 acre feet, the larger portion of the water supply hitherto passing across the state line into Kansas can be captured and conserved in said Caddoa Reservoir.*

for the reason that the undisputed evidence shows that with the completion of the Caddoa Reservoir a large portion of flash floods hitherto passing down the stream into Kansas can be captured and controlled therein.

IV

Defendants except to the third paragraph of the third finding of fact in its present form, and move the court to substitute in lieu thereof the following language:

> Precipitation, melting snows, temperature, evaporation and wind velocity, and the character of the soil appear to be factors which are inter-related in crop production and of sources of water supply of the Arkansas River, and in the mountainous region along the western boundary of the Arkansas River Basin the annual precipitation runs between 20 and 30 inches, which is principally in the form of snow, and going eastward to the plains region in Colorado, the precipitation in this area ranges generally between 11 and 16 inches, and passing further east to the area from the Colorado-Kansas state line to

> Dodge City, the precipitation ranges from 15 to 20 inches, and continuing east along the river and from where the first tributary in Kansas joins the main stream and then to the Oklahoma state line the precipitation increases 20 to 30 inches. The mean average annual temperature in the Colorado area ranges from two to five degrees lower than in Kansas area and in Western Kansas the wind velocities are higher than in the eastern region in Colorado, which has an effect upon evaporation. The soils in both Colorado and Kansas areas are well suited to irrigation, but the character of the soil in Kansas area, which contains more silt than in the Colorado area, will hold larger quantities of water without loss by deep percolation. *The fractionally greater monthly precipitation in the Kansas area is largely dissipated by the greater evaporation, so that the beneficial effect of precipitation on plant growth in both areas is substantially equal. The result is that crops under natural conditions without the aid of irrigation produce substantially the same yields per acre in eastern Colorado as in western Kansas.*

for the reason that (1) the requested finding is supported by the undisputed evidence; (2) as requested, shows the actual result of the interrelated climatic and soil factors referred to by the Special Master; and (3) is an essential finding in determining the need for irrigation in the respective areas in Kansas and Colorado.

V

Defendants except to Finding of Fact No. Seven and move the court to substitute in lieu thereof the following:

> The ~~irrigated acreage~~ *acreage irrigated* in the State of Colorado ~~of~~ *from* the water supply of the Arkansas River and its tributaries is 469,168 acres which has increased from the time the users of that state first began to irrigate their lands to the present, *169,168 acres being the extent of the increase over the amount of acreage which the Supreme Court of the United States found was being irrigated at the time of its former decision in the case of Kansas v. Colorado,* and such water supply so used is of the waters of the River and its tributaries in Colorado, and has after considering it and the return flow section resulted in the diminution of the yearly average flow at the state line.

for the reason that said increased acreage above referred to is an undisputed fact and is a substantial factor in the depletion of stream flow into Kansas.

VI

Defendants except to the failure of the Master to make a finding upon the extent of the acreage in the irrigation area of Kansas which could have been irrigated from ditches and laterals originally constructed,

and move the court to make an additional finding of fact as follows:

> *That the extent of land which could be irrigated in Kansas from ditches and laterals heretofore constructed, amounts to approximately 414,000 acres, the development of which was rendered impossible by Colorado's water diversions.*

for the reason that this fact is supported by the undisputed evidence and is an essential contributing fact in determining the equities in the apportionment of the available water supply between the states of Kansas and Colorado.

VII

Defendants except to the failure of the Master to make a finding upon the effect of Colorado uses upon the water supply available to Kansas users for irrigation purposes, and defendants move the court to find as follows:

> *Colorado, being the upper state, has the first opportunity to divert and use the waters of the Arkansas River for irrigation purposes, and has so diverted and used said waters to the extent that users in Kansas have been deprived of practically all of the dependable flow of the stream. Such water as at present passes across the state line into Kansas consists of flash floods of a day or a few days duration, most of which is not subject*

to diversion or use. Water which can be captured from such floods is intermittent and bears little or no relation to crop requirements.

Such finding is requested for the reason that (1) the facts stated therein are undisputed in the evidence; (2) the finding contains basic facts which indicate the delivery of such water as is apportioned to the State of Kansas must be made upon a dependable basis in conformity with irrigation needs; (3) the finding contains facts which clearly show that water apportioned to Kansas must be protected from upstream depletion in Colorado.

VIII

Defendants except to the language of the eighth finding of fact, and move the court to substitute in lieu thereof:

Amount of water awarded the State of Colorado. Of the average annual dependable water supply ~~and flow~~ of the Arkansas River and its tributaries there should be awarded ~~and delivered~~ to Colorado *the right to use* 925,000 acre feet *or 83.33% thereof*, and in the event of a ~~deficiency~~ *decrease* or increase in the ~~flow~~ *supply of water* of the river and its tributaries the ~~then available~~ supply in the river and its tributaries should be prorated in relation to the dependable average annual amount so awarded to Colorado.

for the reasons: (1) that the said water supply subject to apportionment between the two states originates in Colorado and is subject to diversion and use, and the use of the word "delivered" in this finding of fact is ambiguous and surplusage; (2) that the percentage of the total dependable supply should be included, since it is a constant factor in determining the pro-ration of the water supply; and (3) the use of the word "flow" is inapplicable, since the term "water supply" is obviously intended by the Master.

IX

Defendants except to the language of the ninth finding of fact, and move the court to substitute therefor the following:

> *Amount of Water awarded to the State of Kansas.* The irrigated acreage in the State of Kansas of the water supply of the Arkansas River and its tributaries is 65,028 acres, and as the Colorado water users having the first opportunity to utilize and consume the stream flow of the river before it passes into the state of Kansas, there should be awarded and delivered to the State of Kansas, at the Colorado-Kansas state line, 185,000 acre feet, *or 16.67%* annually of the average annual dependable water supply ~~and flow~~ of the ~~river stream~~ *basin* for the irrigation in Kansas of the lands now being irrigated, and for lands to be

irrigated, and lands irrigated from the waters of the Arkansas River prior to the time the State of Colorado increased her development in irrigation, and of which amount 150,000 acre feet of water should be delivered to the State of Kansas at the Colorado-Kansas state line during the season from April 1 to October 1, of each year and 35,000 acre feet thereof to be delivered at the state line during the winter season from October 1 to April 1, at such times and in such amounts ~~of the 35,000 acre feet as the same could be delivered for irrigation or storage when~~ required by the water officials of Kansas, and in the event of a ~~deficiency~~ *decrease* or increase in the ~~flow~~ *water supply* of the river and its tributaries, the ~~then available~~ supply ~~in the river~~ should be pro-rated in relation to the dependable average annual amount so awarded to Kansas.

for the following reasons: (1) that the percentage of the water supply apportioned is a constant factor and is necessary in determining the pro rata apportionment; (2) the following language: "Of the 35,000 acre feet as the same could be delivered for irrigation or storage," deleted from the original finding of the Master is ambiguous; is in disagreement with proposed paragraph Two of the Decree, and unless the summer flow is delivered to the State of Kansas in conformity with irrigation needs or upon demand of the water officials of the State of Kansas, no dependable supply could or

would be made available for irrigation uses in Kansas; (3) the substitution of the words "water Supply" for "flow" more clearly expresses the intention of the Special Master.

X

The defendants except to the Special Master's twelfth finding of fact and move the court to substitute in lieu thereof the following:

> *Measuring stations to be established.* The water supply of the Basin comes from two distinct sources, the mountain water supply and the plains water supply. The first ~~is irregular~~ *fluctuates seasonally* in its occurrence as the rise of the streams ~~occurring~~ *occurs* with melting snows ~~and~~. The other or plains run-off ~~being erratic~~ *results from rainfall over the plains area and is erratic, both in occurrence and amount.* ~~sometimes large and sometimes small.~~
>
> *In order to determine the quantum of water available for delivery pursuant to the apportionment herein made, as and when such water originates,* two designated measuring points should be established, one of which will serve as an index of mountain water supply and another station selected which will serve as an index of the plains water supply. *While these stations would record only a portion of the water supply of the basin available for irrigation, use and distribution, the amount measured as passing such stations would serve as the most practical index available from*

which the total water supply as herein apportioned could be computed as such supply originates and is available for use. The water measured at those stations will vary up or down as those two types of the water supply in the Basin varies, and the burden *or* ~~of~~ benefits of wet years and dry years would be borne in the same proportion as the equitable distribution of water supply is decreed. ~~In allowing the water supply~~ One *such* station should be located at Canon City, Colorado, *where measurements of the water passing such station* ~~which~~ would serve as an index of the mountain water *supply.* ~~and~~ The other *such* station, a measuring station ~~to~~ *should* be located near the mouth of the Purgatoire River ~~where the run off at that point is practically all plains run off~~ and ~~it~~ would serve as an index of the plains water supply. ~~and~~ *The total of the water passing such stations constitutes fifty-four percent (54%) of the water supply of the Basin and from the measurements of* the two stations when used together *can be* ~~would determine the amount of river flow~~ *computed the portion of the total water supply of the Basin which shall accrue* ~~to come down the river~~ for delivery to ~~Colorado and to~~ Kansas ~~and the amount of water awarded to the state of Kansas at the state line where a station should be located and a measuring device established to determine the amount of water for delivery to the state of Kansas to be measured day by day as such water supply originates and becomes measurable as stream flow~~ *pursuant to the apportionment herein for use and delivery as the same originates. In order to compute and assure*

a delivery of the sixteen and sixty-seven hundredths percent (16.67%) of the total water supply of the Basin, the amount of water herein awarded to the State of Kansas at the state line, thirty and eighty-seven hundredths percent (30.87%) of the amount passing said two index stations, which equals in amount said sixteen and sixty-seven hundredths percent (16.67%), shall become the basis of an accrual of water for delivery to Kansas and an equivalent amount shall thereafter be subject to delivery as required by Kansas water officials at the state line.

A third station should be located and a measuring device established at or near the Colorado-Kansas state line to measure the amount of water as herein apportioned, which is delivered to the state of Kansas, such deliveries to be measured day by day as the basin water supply originates and is computed through the use of the said two index stations. Daily amounts passing state line stations in quantities larger than the amounts computed from the index stations as accruals for delivery shall be classed as flood water and shall not be considered as a delivery under the allocation herein determined.

Defendants' reasons for the foregoing suggested findings are: (1) That the language used by the Special Master in said twelfth finding of fact is somewhat ambiguous, and from the standpoint of administration, must be clarified; (2) While the use of the two index

stations is probably the only feasible method which can be used to determine the water supply, which is subject to apportionment when and as the same accrues, it is necessary that the finding of fact disclose clearly what the evidence shows the facts to be: namely, the exact proportion of the total water supply of the Basin which the measured flow at the index stations reflect; (3) Since some portion of the total water supply originates below the index station, it is essential that the finding indicate clearly that while the proportional amount of water passing the index stations is the measure of the amount to be delivered to Kansas, such quantity can be satisfied by the delivery of an equivalent amount based upon the accrual as shown by the index stations' records; (4) The finding of the Master with respect to the third station located at the state line, is ambiguous and uncertain. Such station of necessity being at the delivery point, cannot measure the water supply of the basin, but can only record the deliveries of water in conformity with the amount apportioned to Kansas.

XI

Defendants except to Conclusion of Law Two and move the court to substitute therefor the following:

> That the State of Colorado be awarded ~~and delivered to it~~ *the right to use* 925,000 acre feet *or eighty-three and thirty-three hundredths percent (83.33%)* annually of the average annual dependable water supply of the Arkansas River and of the stream flow of the river and its tributaries, and in the event of a ~~deficiency~~ *decrease* or increase in the natural ~~flow~~ *water supply* of the river *and its tributaries* the ~~then available~~ *water* supply ~~in~~ *of* the river and its tributaries should be prorated in relation to the dependable average annual amount so awarded to Colorado.

for the following reasons: (1) That the supply subject to apportionment between the two states originates in Colorado and is there subject to diversion and use, and the use of the word "delivered" in this conclusion of law is ambiguous and surplusage; (2) Not only should the amount in acre feet of the average dependable water supply be given, but likewise the percentage of the average annual dependable water supply, since the percentage factor, which is constant, must be utilized to determine apportionment in the event of increases or decreases over the average annual dependable amount used by the Special Master in apportioning the water

supply; (3) This conclusion of law should be corrected to conform with corrected Finding No. Eight.

XII

Defendants except to the Conclusion of Law No. Three of the Special Master, and move the court to make, in lieu thereof, the following conclusion:

> That there should be awarded and delivered to the State of Kansas, at the Colorado-Kansas state line, *One hundred and Eighty-five Thousand* (185,000) acre feet, *or sixteen and sixty-seven hundredths percent* (*16.67%*) annually of the average annual dependable water supply ~~and flow~~ of the river ~~stream~~ for the irrigation in Kansas of the lands now being irrigated, and for lands to be irrigated, and lands irrigated from the waters of the Arkansas River prior to the time the State of Colorado increased her development in irrigation, and of which amount *One Hundred and Fifty Thousand* (150,000) acre feet of water should be delivered to the State of Kansas at the Colorado-Kansas state line during the season from April 1 to October 1, of each year, and *Thirty-five Thousand* (35,000) acre feet thereof to be delivered at the state line during the winter season from October 1 to April 1, at such times and in such amounts ~~of the 35,000 acre feet as the same could be delivered for irrigation or storage when~~ required by the water officials of Kansas, and in the event of a ~~deficiency~~ *decrease* or increase in the ~~flow~~ *water supply* of the river and

its tributaries, the ~~then available~~ supply ~~in the river~~ should be pro-rated in relation to the dependable average annual amount so awarded to Kansas.

for the following reasons: (1) That the percentage of the water supply apportioned is a constant factor and is necessary in determining the annual apportionment; (2) The following language: "Of the 35,000 acre feet as the same could be delivered for irrigation or storage," deleted from the original finding of the Master is ambiguous; is in disagreement with the proposed paragraph (Two) of the Decree, and unless the summer flow is delivered to the State of Kansas in conformity with irrigation needs or as required by the water officials of The State of Kansas, no dependable supply could or would be made available for irrigation uses in Kansas; (3) The substitution of the words "water supply" for "flow" is clearly the intention of the Special Master; (4) Conclusion No. (Three) should be corrected to conform with the suggested correction in Finding No. Nine.

XIII

Defendants except to the Special Master's Conclusion of Law No. Five and move the court to modify the same by substituting therefor the following:

There is required to be established by the states of Colorado and Kansas ~~three~~ modern measuring devices at *two* stations *herein named, which shall be used* to accurately measure the *flow of* water *passing such stations* ~~supply of the Arkansas River and the flow of the river and its tributaries~~, one of which is to be located at a station at Canon City, Colorado and one to be located near the mouth of the Purgatoire River. *The recorded flows of water passing such two stations shall serve as an index from which may be computed for the purpose of apportionment the total water supply of the Basin when and as the same originates. Thirty and Eighty-seven hundredths percent (30.87%) of the water passing such station, which is sixteen and sixty-seven hundredths percent (16.67%) of the total Basin water supply, shall be the amount of water which accrues to Kansas as its equitable share and which is subject to delivery at the state line, and an equivalent amount of water shall, after the same accrues, be delivered by the State of Colorado at the state line as required by the Kansas state water officials.* ~~and another~~ A third station *shall be established* where the water shall be accurately measured, located on the river at the Colorado-Kansas state line to ~~determine~~ *record* the amount of water ~~flowing in the river that should be~~ delivered to the State of Kansas *day by day pursuant to the apportionment herein determined as such water supply is computed through the use of said index stations as having accrued for delivery to Kansas, but the amounts of water passing such station in daily amounts larger than the accrued amounts as shown by said*

index stations, shall be classed as flood waters and shall not constitute a delivery under the allocation herein unless the same shall have been made pursuant to the request of Kansas state water officials. ~~and~~ The expense of the construction and operation of the measuring devices shall be equally borne by the states of Colorado and Kansas, and in the event the two states are unable to agree upon one to so construct and operate the same, then the court should appoint someone to construct and operate such measuring devices.

For the reasons: (1) That the language as used is somewhat ambiguous; (2) is not sufficiently detailed to reflect the function of such measuring stations; and (3) in order to conform with requested Finding No. Twelve.

XIV

Defendants except to the first paragraph of the Special Master's Ninth Conclusion of Law, and move the court to modify the language therein by substituting in lieu thereof the following:

> That the State~~s~~ of Colorado ~~and Kansas and each of them~~ and ~~their~~ *its* officers, agents, representatives and employees are perpetually enjoined from diverting and using any water from the Arkansas River and its tributaries in excess of the amounts awarded and herein decreed to them,

for the reason that, the State of Kansas, as the lower

state, cannot divert, take or use any of the water supply originating in Colorado, except such flow as is delivered to it at the Kansas-Colorado state line, and therefore the language enjoining the State of Kansas, its officers, agents, representatives, employees and citizens, as suggested by the Special Master, is surplusage.

Exceptions of Defendants to the Recommendations for a Decree Submitted by the Special Master

I

Defendants except to the recommended decree (One) of the Special Master, and suggest that there be substituted therefor and in lieu thereof the following:

> That the State of Colorado is awarded, granted and decreed to be the owner and entitled to the use of ~~and to be delivered to it~~ *Nine Hundred and Twenty-five Thousand* (925,000) acre feet *or Eighty-three and Thirty-three hundredths per-cent* (83.33%) of water annually of the annual dependable water supply ~~and flow of the stream~~ of the Arkansas River and its tributaries, and in the event of a ~~deficiency~~ *decrease* or increase in the ~~natural flow~~ *supply of water* of the Arkansas River and its tributaries the ~~then available~~ supply of water ~~in~~ *of* the river and its tributaries shall be pro-rated in relation to the dependable *annual* amount ~~annually~~ here awarded and granted to the state of Colorado.

for the reasons that: (1) The said water supply subject to apportionment between the two states, originates in Colorado and is subject to diversion and use, and the use of the word "deliver" suggested herein is ambiguous and surplusage; (2) that the percentage of the total dependable supply found by the Master to be Colorado's share should be specifically stated, since it is a constant factor in determining the pro-ration of each year's water supply; and (3) the use of the word "flow" is inapplicable, since the Basin water supply is that which is being apportioned and was obviously so intended by the Special Master.

II

Defendants except to paragraph No. (Two) of the proposed decree and move the court that in lieu thereof, the following should be substituted:

> It is also considered, ordered and decreed that the State of Kansas is awarded, granted and decreed to be the owner and entitled to the use of and to ~~be~~ *have* delivered to it *by the State of Colorado or its water officials* at the Colorado-Kansas state line, *One Hundred and Eighty-five thousand* (185,000) acre feet of water, *or Sixteen and Sixty-seven hundredths percent* (*16.67%*) annually of the annual dependable water supply and flow of the stream of the Arkansas River, and of

which amount *One Hundred and Fifty Thousand* (*150,000*) acre feet thereof shall be delivered to the State of Kansas at the Colorado-Kansas state line during the season from April 1 to October 1 of each year, and *Thirty-five Thousand* (35,000) acre feet thereof to be delivered to the State of Kansas at the Colorado-Kansas state line during the winter season from October 1 to April 1, at such times and in such amounts as and when required by water officials of the State of Kansas, and in the event of a *decrease*, ~~deficiency~~ or increase in the ~~natural flow~~ *water supply* of the Arkansas river and its tributaries, the ~~then available~~ *water supply* ~~supply of water in the river and its tributaries~~ shall be pro-rated in relation to the dependable amount annually here awarded and granted to the State of Kansas.

For the following reasons: (1) That the percentage of the water supply apportioned is a const[redacted] factor and is necessary in determining the annual ap[redacted]ionment of the existing water supply; (2) That the substitution of the words "water supply" for "natural flow of the river and its tributaries" is clearly the intention of the Special Master.

III

Defendants except to paragraph (Four) of the proposed decree and move the court to modify the same and substitute in lieu thereof the following:

It is further considered, ordered and decreed that there is required to be established by the State of Colorado and the State of Kansas ~~three~~ modern measuring devices at *two* stations to measure accurately the *flow of* water *passing such stations,* ~~supply of the Arkansas River and the flow of the river and its tributaries,~~ one of which is to be located at a station at Canon City, Colorado and one to be located near the mouth of the Purgatoire River. *The recorded flows of water passing such two stations shall serve as an index from which may be computed for the purpose of apportionment the total water supply of the Basin when and as the same originates. Thirty and Eighty-seven hundredths percent (30.87%) of the water passing such stations, which is Sixteen and Sixty-seven hundredths percent (16.67%) of the total Basin water supply, shall be the amount of water which accrues to Kansas as its equitable share and which is subject to delivery at the state line, and an equivalent amount of water shall, after the same accrues, be delivered by the State of Colorado, its officers, agents, representatives and employees at the state line as required by the Kansas state water officials* ~~and one to be located where the water flowing in the river shall accurately be measured on the Arkansas River at the Colorado-Kansas state line of the amount of water here decreed to be delivered to the State of Kansas.~~ *A third station shall be established, located on the river at the Colorado-Kansas state line, where the water shall be accurately measured to record the amount of water that is to be delivered to the State of Kansas as*

decreed herein, as such water supply is computed through the use of said index stations to accrue for delivery to Kansas, but amounts of water passing such state line station in quantities larger than the amounts accruing daily as shown by said index stations, shall be classed as flood waters and shall not constitute a delivery under the allocation herein unless the same shall have been made pursuant to the request of the Kansas state water officials, ~~and~~ The expense of the construction and operation of the measuring devices shall be equally borne by the states of Colorado and Kansas, and in the event the two states are unable to agree upon one to so construct and operate the same, then the court shall appoint someone to construct and operate such measuring devices.

For the reasons that (1) the language used in said proposed paragraph is uncertain and in some places ambiguous; and (2) that the functions of the proposed stations suggested by the Special Master have not been made sufficiently clear to permit competent administrative operation.

IV

Defendants except to paragraph (Eight) of the proposed decree and move the Court to modify the same and substitute in lieu thereof the following:

It is further considered, ordered and decreed that the State of Colorado ~~and the State of Kansas and each of them and their~~ *its* officers, agents, representatives; ~~and~~ employees *and citizens* be,

and they are hereby severally perpetually enjoined from diverting, taking and using any water from the Arkansas River and its tributaries in excess of the amounts herein awarded to ~~them~~ *the State of Colorado.*

for the reason that the State of Kansas, as the lower state, cannot divert, take or use any of the water supply originating in Colorado, except such flow as is delivered to it at the Kansas-Colorado state line, and therefore the language enjoining the State of Kansas, its officers, agents, representatives, employees and citizens, as suggested by the Special Master, is surplusage.

Respectfully submitted,

A. B. MITCHELL,
Attorney General of Kansas,
Topeka, Kansas,

ELDON WALLINGFORD,
Assistant Attorney General,
Topeka, Kansas,

W. E. STANLEY,
First National Bank Building,
Wichita, Kansas,
Attorneys for the State of Kansas.

W. E. STANLEY,
Attorney for the Finney County Water Users' Association, a Corporation.

19-7913

FILE COPY

Office - Supreme Court, U.S.
FILED
SEP 14 1943
CHARLES ELMORE CROPLEY

No. 5 ORIGINAL

In the Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

BRIEF FOR DEFENDANTS

A. B. MITCHELL,
Attorney General of Kansas,
Topeka, Kansas,

ELDON WALLINGFORD,
Assistant Attorney General,
Topeka, Kansas,

W. E. STANLEY,
First National Bank Building,
Wichita, Kansas,
Attorneys for the State of Kansas.

W. E. STANLEY,
Attorney for the Finney County Water Users' Association, a Corporation.

SUBJECT INDEX

	PAGE
I. JURISDICTION	3
II. STATEMENT OF CASE	4
A. Pleadings	4
B. Facts Relating to Stream System	14
C. Soil in Relation to Agriculture	19
D. Irrigation	21
1. Irrigation in Kansas	21
2. Irrigation in Colorado	22
3. Development of Irrigation	24
4. Water Supply Available for Irrigation	28
E. Controversy Resulting from River Depletion by Colorado	31
F. Master's Report	34
III. SPECIFICATIONS OF EXCEPTIONS TO MASTER'S REPORT TO BE URGED HEREIN	36
IV. ARGUMENT	41
A. Principle of Law Controlling this Case	41
B. The Arid Area in Kansas is Solely Dependent upon the Water Supply from Colorado for Practice of Irrigation	49
C. Relative Need for Water in Crop Production in the Two States	52
D. Development of Kansas Irrigation Opportunities Rendered Impossible by Colorado Use	62
E. Extent of Water Depletion by Colorado, and Character of Water Supply Remaining	66
1. Temporary and Permanent Depletion	68
2. Irrigation Acreage as Measure of Permanent Depletion	69
3. Reservoir Development as an Additional Factor	73
4. Progressive Character of Depletion	76
5. Character of Residual Flow into Kansas	81
(a) Monthly Diversions in Colorado Compared with Divertible Water Passing Across the State Line	84
(b) The Utility of State Line Flow for Irrigation	87
(c) Effect of Diversions for Storage in Colorado on State Line Flow	101

F. Effect of Caddoa Reservoir 108
G. Equitable Apportionment 115
H. Requirement of Decree which will Protect and Insure Delivery at the State Line of Kansas' Share in Accordance with Irrigation Requirements 119
1. Method to be Used 119
2. Recording of Water Delivery to Kansas at State Line 134
3. Delivery of an Equivalent Amount Equal to Kansas' Share Computed at Index Stations 136
4. Protection to Kansas' Apportionment against being Satisfied by Usable Water through Flash Floods ... 139
I. Why Enjoin Kansas? 140
V. Conclusion 143

LIST OF AUTHORITIES CITED

Cases: PAGE
Connecticut v. Massachusetts, 282 U. S. 660, 51 S. Ct. 286 .. 43
Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U. S. 92, 58 S. Ct. 803 44
Kansas v. Colorado, 206 U. S. 46, 27 S. Ct. 655 41
New Jersey v. New York, 283 U. S. 336, 515 S. Ct., 478 .. 44
Wyoming v. Colorado, 259 U. S. 419, 42 S. Ct. 552 43

Kansas Statutes:
Chapter 23, General Statutes of Kansas, 1868 21
Chapter 58, Session Laws of 1876 21
Chapter 133, Session Laws of 1885 21
Chapter 134, Session Laws of 1885 21
Chapter 115, Laws of Kansas, 1886 21
Chapter 133, Session Laws of 1891 22
Chapter 42, Revised Statutes of Kansas, 1923 22

In the Supreme Court
of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

No. 5 ORIGINAL

BRIEF FOR DEFENDANTS

I. Jurisdiction

This is an action instituted by the State of Colorado against the State of Kansas and one of its citizens, The Finney County Water Users' Association. Original jurisdiction arises under Article III, Section 2 of the Constitution. Leave to file the Bill of Complaint was granted on January 3, 1928. The controversy involves the equitable apportionment of the waters of the Arkansas River between the two states.

Testimony was taken before a stenographic commissioner appointed by this court until December 21, 1939, when both parties rested. Thereafter, the Honorable Charles C. Cavanah was appointed Special Master, and the case reopened for additional testimony. The report and recommendations of the Special Master were filed in the cause in May, 1943, and the cause is before the court on the exceptions taken to the Special Master's report.

II. Statement of Case

A. PLEADINGS

A very brief summary of the main issues as presented by the pleadings is as follows:

On January 3, 1928, the State of Colorado was granted leave to file its original Bill of Complaint in equity. Therein it was claimed:

A. That the waters produced in the State of Colorado belong to that state; and that the courts of the state forbid by rules of public policy, (1) recognition of claims, or (2) use of water outside the boundaries of the state. Claimed the right to use and distribute within its borders all of the waters originating and flowing therein to such of its citizens as it chose to select, without regard to the

claims of the citizens of any other state, including the State of Kansas, subject only to such limitations as the Supreme Court of the United States might determine to exist between the state and other sovereign states; and that the State of Colorado has assumed the responsibility in its sovereign capacity for such obligations, if any, as the state bears to other sovereignties.

B. That Colorado recognizes the necessity of maintaining and dealing with state rights on interstate streams as a whole, and that settlement of differences respecting irrigation matters is imperative between states.

C. That the suit instituted by Kansas about May 20, 1901, against Colorado, decided in 1907, adjudicated that the quantum of water represented by appropriations and diversions existing within the State of Colorado in the year 1907 was within the lawful rights of the state, and that the continuance of such appropriations and diversions was in legal effect quieted to the State of Colorado, its corporations and citizens.

D. That no material increase has been made in the depletions of the waters of the Arkansas River, and that the substantial interests of the State of Kansas

have not been detrimentally altered or the equitable apportionment of the benefits disturbed since said date.

E. That certain citizens of Kansas have engaged in litigation with private enterprises in Colorado, demanding recognition of certain priorities and delivery of water in accordance with said priorities; that suits involving determination of priorities are pending in the District Court of the United States for the District of Colorado; and that the continuance of such litigation should be enjoined.

F. That private rights which may exist within the State of Kansas for the use of water from the Arkansas River are derivated purely from the sovereignty of Kansas under such policy as is in force or which it may adopt, and that all such rights within the State of Kansas are to be allocated such quantum of water or use as the State of Kansas may be entitled to by equitable principles adjudicated by this Court.

G. That Colorado offers to do full equity to the State of Kansas in respect to the administration and use of the waters of the Arkansas River, and prays that the Supreme Court of the United States may reserve to itself sole jurisdiction, and protect itself in its sole jurisdiction over the determination of the use of the waters

of the Arkansas River as between the states of Colorado and Kansas, and may quiet the rights of the State of Colorado under the adjudication in *Kansas v. Colorado*, and give such relief as may be just and equitable.

After a motion to dismiss the Bill of Complaint, which was by the Supreme Court denied without prejudice to any question Kansas and The Finney County Water Users' Association filed their separate answers.

In these answers it was:

A. Denied that Colorado owned all of the flowing water of the Arkansas River and its tributaries within that state, and alleged that the same was an interstate stream and that the water must be shared equitably between the citizens and residents of Colorado and the citizens and residents of Kansas; and denied that the use of water for irrigation or other purposes in Colorado has been actually in subordination to the limitations that this Court has determined to exist as between Colorado and another state or states, and alleged that the conduct of Colorado has been without regard for and in violation of the rights of Kansas and of its citizens.

B. Denied that Colorado had assumed responsibility in a sovereign capacity for such obligations, if any, with regard to the water flowing in the Arkansas River, as it

bore to Kansas; denied that the claims that the use of water from the Arkansas River and its tributaries in Colorado for irrigation in that state constitute rights as against the State of Kansas or its citizens, and denied that under the administration of water by Colorado a uniform use with maximum economy and consideration of public welfare was maintained.

C. Denied that in the case of *Kansas v. Colorado* the Court determined that the quantity of water represented by the appropriations and diversions existing and carried on within the State of Colorado under its authority in the year 1907 was within the lawful rights of Colorado, or that such appropriations and diversions were by such decision in legal effect quieted to Colorado.

D. Claimed that certain ditches in Kansas were constructed, ditches begun, and water appropriated as follows: Garden City Ditch 1879, Finney County Water Users' Association 1880, South Side Ditch 1880, Great Eastern 1881, Fort Aubrey 1882, Alamo 1883, Amazon Ditch 1887, and Frontier Ditch 1892, but that on account of the increased taking of water from the Arkansas River and its tributaries, farming operations under said ditches were conducted with difficulty, and water was

inadequate for the purpose of successfully raising agricultural crops.

E. Claimed that the flow of water into Kansas from Colorado has been steadily and continuously diminished in all the period from 1880 to 1928, and that the development of irrigation in the State of Kansas has been obstructed, diminished and delayed; that most of the ordinary flow of the Arkansas River from Colorado into Kansas has been consumed in Colorado; that most of the water flowing by river from Colorado into Kansas has been from extraordinary rains on the plains, causing floods of short duration at each time; that Colorado by means of reservoirs has brought about increased taking of water from the River, has decreased the water supply to Kansas, and that large areas of land lying under ditches in Kansas, which could have been irrigated if water had been available, have not been irrigated for lack of water by increased taking of Colorado; that from the time of filing the Bill of Complaint in *Kansas v. Colorado* continuously until the time of the filing of the Bill of Complaint in this case, the amount of water taken in Colorado from the Arkansas River and its tributaries has been greatly increased, and that the depletion of the waters of the Arkansas River flowing

into Kansas has thereby greatly increased, with great injury to Kansas, and its citizens; and that irrigation of agricultural lands from the waters of the Arkansas River have been injured, obstructed and diminished.

F. That the issues and decision in the case of *Kansas v. Colorado* did not pertain to any questions of priority in the rights of appropriations of water, but only to a claim of Kansas to have the water allowed to flow by said River from Colorado into Kansas as it had naturally flowed; and that the Bill of Complaint was dismissed without prejudice to any Bill of Complaint by the State of Kansas pertaining to the flow of water from the Arkansas River into the State of Kansas.

G. The State of Kansas prayed that the court would protect and quiet the rights of the State of Kansas and its citizens to their apportionment of water in the Arkansas River for irrigation of lands in Kansas as against the acts of parties in Colorado who have later rights than those in Kansas; and that the rights of residents or citizens of Kansas to divert water from the Arkansas River for the purpose of agricultural irrigation in Kansas be decreed in second feet, and that the agents, residents and citizens of Colorado and the State of Colorado be perpetually enjoined from diverting any water

from the Arkansas River or its tributaries in Colorado until the rights of the citizens and residents of Kansas to divert water shall be satisfied; and be enjoined from diverting water to the injury of the rights of the State of Kansas, its residents or citizens, and for further relief as may be equitable.

The Finney County Water Users' Association in substance claims that its prior right to 250 second-feet of river flow as of December, 1880, be recognized and decreed as against the State of Colorado and its citizens diverting water from the Arkansas River and its tributaries.

Colorado replied to that part of the separate answer of the State of Kansas, praying for affirmative relief.

Colorado denies that the waters of the Arkansas River since 1901 have been further depleted by diversion and use in Colorado; alleges that the water supply crossing the state line available for use in Kansas has improved in quantity and character; and maintains that Colorado is not now taking more than its equitable share of the water supply.

A. Colorado alleges that the decision in the case of *Kansas v. Colorado* determined the rights of the two states in and to the waters of the Arkansas River to the

date and as of the date of the closing of testimony (1905), and alleges no question of law or fact remained undetermined in said cause, except such as might arise from events subsequent to the closing of testimony in that cause.

B. Colorado admits the construction and existence prior to 1901 of the Frontier Ditch, the Alamo Ditch, the Fort Aubrey Ditch, the Amazon Ditch, the South Side Ditch, the Great Eastern Ditch, The Finney County Ditch, and the Garden City Ditch, but alleges that none of the other ditches mentioned by Kansas in its answer ever reached completion or actually operated or diverted water in any real or substantial extent.

C. Colorado alleges that its land is sterile without irrigation, and that its people have spent vast sums of money in developing irrigation enterprises. Colorado also asserts that the inhabitants of the basin are entirely dependent upon the water of the River for a livelihood either directly or indirectly.

D. Colorado alleges that Kansas has little need of water from the Arkansas River for irrigation, but that rainfall is generally sufficient in Kansas for crop production. Colorado states that Kansas has done little to avail itself of water at its disposal; that Kansas has

built no reservoirs or storage facilities, with one minor exception; and that Kansas has not taken full advantage of the ground water available.

E. Colorado further alleges that Kansas is as a whole more prosperous than Colorado; that its agricultural resources are much more varied, and the western counties, even those bordering on the Arkansas River, have shown a gain in wealth and prosperity comparable with the remainder of the state; but on the other hand the Arkansas valley in Colorado, being dependent entirely upon agriculture based upon irrigation, has definite limitations to its development, and has grown in wealth and prosperity much less markedly than the Arkansas valley in Kansas, and is much less capable of definite expansion and improvement.

F. Colorado requests that that part of the "Separate Answer of the State of Kansas" praying affirmative relief be dismissed and that the prayer for relief in the original complaint herein made by the State of Colorado be granted with costs.

Under these pleadings the main issue raised is the equitable apportionment of the water supply of the Arkansas River between the states of Kansas and Colorado.

B. FACTS RELATING TO STREAM SYSTEM

"Course of the Arkansas River. It is one of the principal tributaries of the Mississippi River and it and its tributaries are non-navigable streams arising among the higher ranges of the Rocky Mountains and is formed by the junction of the branches known as East Fork and Tannesses Fork with Lake Fork, at a point near Leadville near the center of the State of Colorado, where the elevation approximates 10,000 feet above sea level. These headwater branches extend up to elevations of 10,500 to 12,000 feet at mountain passes across the Continental Divide, and up to 14,000 feet at the crests of the highest mountain peaks (*R. 68*) and it takes thence a southerly and southeasterly direction passing through the Royal Gorge Canyon to Canon City where the elevation is about 4,900 feet and about 100 miles below its source it passes through Canon City and Fremont County in Colorado. The area above Canon City is drained by small tributaries contributing to the stream the mountain runoff, where precipitation runs from 20 to 30 inches annually (*R. 426*). Its source in the vicinity of Leadville is in the higher range of the Rocky Mountains with a rapid descent until it enters the more pronounced canyon sections immediately below Salida and from there to Canon City it flows through a pronounced canyon section. After it leaves the Royal Gorge Canyon immediately above Canon City it enters through a more or less rugged country, being generally hemmed in by narrow valleys and foothills, and the character of the country is characteristic until it approaches

the City of Pueblo, where the valley widens out and the adjacent foothills recede, and from Canon City to Pueblo it lies at an elevation of approximately 4,300 feet and the fall of the river is about 15 feet to the mile (*R. 72*). It thence flows from Pueblo east to the Colorado-Kansas state line, passing through country where the topography is more gentle and tributaries entering from both sides (*R. 70*), and the fall of the river from Pueblo to La Junta averages 9 feet per mile, and from La Junta to the state line about 7 feet per mile (*R. 72*), and from there to Dodge City the fall of the stream is about 6.8 feet per mile (*R. 506*), and from Dodge City to the Oklahoma state line the average fall is about 5.5 feet per mile. The area of the basin in Colorado as drained by the river amounts to 25,258 square miles and the area in Kansas is approximately 18,238 square miles. Its length in the State of Colorado is about 320 miles and in the State of Kansas about 390 miles, and after entering the State of Kansas it flows through southwestern and south central part of that state, leaving the state at its southerly boundary to enter the State of Oklahoma and flows then for several hundred miles before reaching the Mississippi River." *Master's Finding of Fact Second* (Record references in italics ours.)

A list of the principal tributaries entering the stream in the 175 mile strip from Pueblo to the Colorado-Kansas line is as follows:

Entering from the North:

Name	*Tributary Length*	*Drainage Area*
Fountain River.....	66 miles	930 sq. miles
Chico Creek.....	57 miles	795 sq. miles
Horse Creek.....	87 miles	1,177 sq. miles
Adobe Creek.....	53 miles	751 sq. miles
Big Sandy.....	150 miles	3,145 sq. miles

and entering from the South:

Name	*Tributary Length*	*Drainage Area*
Saint Charles River...	40 miles	498 sq. miles
Huerfano River.....	80 miles	1,765 sq. miles
Apishapa River.....	80 miles	1,090 sq. miles
Timpas Creek.....	35 miles	440 sq. miles
Purgatoire River.....	135 miles	3,390 sq. miles

(Colorado Exh. 32, R. page 493).

Of the above stream listed, the Fountain, the Saint Charles, the Huerfano, the Apishapa, and the Purgatoire all have their sources in the high mountain areas.

In addition to the above major tributaries there are some two or three dozen miscellaneous streams entering from both sides, adding much to the broken character of the topography, and contributing to the River by surface drainage between Pueblo and the state line. Collectively these drain an area of approximately 5,777 square miles (Colorado Exh. 32, page 493).

The entire Colorado area of the basin might well be likened to a great fan, the tributaries forming the ribs, converging on the main ribs on the River channel, and

finally forming a single stream where it passes out of the state a few miles east of the town of Holly.

In Kansas the topography is no longer broken. The flood plain of the River itself is from one-half to three miles in width (R. 2361). On either side the surface rises to heights above the valley floor approximately 60 to 100 feet, and this surface then lies almost as level as a floor, but with enough gradient to insure satisfactory irrigation. In this region thousands of acres are topographically favored with respect to agriculture (R. 2338).

In marked difference to the area from Pueblo to the state line in Colorado, where tributaries are numerous and important, from the Kansas state line to Kinsley, Kansas approximately 160 miles, there are no tributaries which might supplement the stream flow in the Arkansas River whatever (R. 2268). It is only when we reach the vicinity of Larned, approximately 190 miles east of the state line, or 230 miles by river channel, that the first live tributary, the Pawnee, joins the River. (R. 1495). From this point to the southern line of Kansas, where the River passes into Oklahoma, a distance of about 100 miles, several streams contribute to the flow of the River.

> "In the mountainous region along the western boundary of the Arkansas River Basin the annual precipitation runs between 20 and 30 inches, which

> is principally in the form of snow, and going eastward to the plains region in Colorado, the precipitation in this area ranges generally between 11 and 16 inches, and passing further east to the area from the Colorado-Kansas state line to Dodge City, the precipitation ranges from 15 to 20 inches, and continuing east along the river and from where the first tributary in Kansas joins the main stream and then to the Oklahoma state line the precipitation increases 20 to 30 inches." *Master's Report, Finding of Fact Third, page 7.*

Taking the two areas which comprise the Arkansas River basin in Kansas and Colorado together, we have on both the east and west precipitation belts where the range of precipitation is above 20 inches, but in between lies a region both in Kansas and Colorado where rainfall is less than that amount in varying amounts. The United States government in its classification of land areas of the United States placed this region in what is known as the arid or irrigation section (R. 372). Where the rainfall belt is below 20 inches, that area is arid. Below 20 inches rainfall must be supplemented to carry on agriculture in a satisfactory manner (R. 2263). There is an area of precipitation where there is below 20 inches of rainfall lying generally east of the mountains in Colorado and west of a line drawn north and south through Dodge City.

While in this plains area of Eastern Colorado the rainfall, generally speaking, averages approximately three inches less annually than the rainfall in the arid region in Western Kansas, the characteristics are extremely similar—approximately five-sixths of the annual amount falling in the April to October period (Kansas Exhs. 10 and 11, pages 1413 and 1414). Annual amounts considered in relationship to crop needs month by month show only a fractional difference in the average monthly precipitation (Kansas Exh. 12, page 1414).

> "The mean average annual temperature in the Colorado area ranges from two to five degrees lower than in Kansas area and in Western Kansas the wind velocities are higher than in the eastern region in Colorado, which has an effect upon evaporation." *Master's Report, Finding of Fact Third, pages 7 and 8.*

C. THE SOIL IN RELATION TO AGRICULTURE

> "The soils in both Colorado and Kansas areas are well suited to irrigation, but the character of the soil in Kansas area, which contains more silt than in the Colorado area (*R. 2287*), will hold larger quantities of water without loss by deep percolation." *Master's Report, Finding of Fact Third, page 8.*

The more porous soils are those containing a high content of sand and not so much silt. In the more porous

soils such as exist in Colorado, plants find it easier to absorb moisture from the soils than they do in the more compact soils in Western Kansas. It is likewise true that evaporation is less in soils with higher sand content than in those with higher silt content, for the reason that with a given rainfall there is a more rapid percolation into the soil, and consequently more protection from the effects of wind velocity and temperature which bring about evaporation (R. 2287). As a result crops raised in the arid region in Kansas and Colorado without benefit of irrigation are strikingly similar (R. 2299; Kansas Exhs. 103 and 104, page 2295). The yields per acre are likewise substantially the same (R. 2313-2318). The somewhat higher rainfall in the arid area in Kansas does not result in naturally higher yields of the same farm crops. The fact that the yields are practically the same in both states in this group demonstrates that the higher rate of evaporation, wind velocity, higher temperatures and differences in soil conditions in Kansas operate to enable crops grown in Colorado under considerably less rainfall to secure as much benefit for plant growth from such rainfall as they do in the Kansas area (R. 2316).

D. IRRIGATION

> "Both states from their beginning have recognized the need of water for irrigation, and the using for that purpose of the public waters in their states." (*Master's Report, Finding of Fact Fourth, page 8.*)

1. Irrigation in Kansas

As early as 1868, Chapter 23, General Statutes of Kansas, 1868, provided authorization for the formation of corporations for the construction and maintenance of canals for the purpose of irrigation. Chapter 58 of the Session Laws of 1876 further amplified the right, by making it unlawful for any irrigating canal to take and use water in such manner as to interfere with or to diminish the supply of water flowing to or through any established irrigating canal, thus recognizing thereby the superior right of the prior appropriator. Chapter 133 of the Session Laws of 1885 provided for liens upon crops for water furnished through irrigation. Chapter 134 of the Session Laws of 1885 provided penalties for the injuries to irrigating canals. Chapter 115 of the Laws of Kansas 1886, Section 1, is as follows:

> "The right to the use of running water flowing in a river or stream in this state for the purposes of irrigation may be acquired by appropriation. As

between appropriators, the first in time is the first in right."

Under this law the method of obtaining a water right requires posting of notice with a claim of the amount of water to be diverted, the place of diversion, and the size of the canal (Sec. 3). The posting of notice at the place of diversion and filing with the county clerk was required (Sec. 3). Work was required to be commenced within sixty days, and prosecuted diligently to completion (Sec. 4B). By compliance with rules the claimant's right relates back to the time of posting notice (Sec. 4). The courts of the state were open for adjudication of disputes arising respecting rights.

Session Laws of 1891, Chapter 133, dealt exhaustively with use of water for irrigation, its application to beneficial use, the abandonment of the right. Distribution in order of priority was provided for and provision made for its enforcement. The Revised Statutes of Kansas, 1923, includes these acts under Chapter 42, Irrigation. (See Appendix A, Separate Answer of the State of Kansas.)

2. Recognition in Colorado

Colorado by its constitution recognized the need, and early by appropriate legislation provided for its development.

The obtaining of a water right in Colorado is initiated by filing a map and statement of claim with the state engineer (R. 1367). The applicant was required to file a plat showing the extent of the project, the amount of the appropriation, and the land expected to be irrigated, sometimes especially set out and sometimes not (R. 858). The applicant can make claim for any amount he thinks he can use (R. 1368). The second step is the construction of the project. The third step is the application of water to a beneficial use (R. 1367). This must be within a reasonable time, which may be a matter of 5 years or 10 years for a large canal.

The next step was to institute proceedings in the district court of the water users' particular district for an adjudication (R. 1372). Notice was served on all water users in the district (R. 863). No notice was given of such proceedings to the water users in other districts which are above it and below it (R. 1372), nor was notice of any kind given or required to be given to water users lower down on the stream and outside of the state of Colorado (R. 1372). Prior to the statute passed in 1923 water users in other water districts had no right to come into an adjudication in a district court other than their own (R.

860), and the only remedy afforded such water users in other districts was an action in a court of equity (R. 860).

These adjudications sometimes came years after the filing date (R. 1370), but on the doctrine of relation the date of the priority and the amount of water adjudicated related back to the date of the original filing (R. 1375). Since the decree is defined in second feet, diversion and application to beneficial use of canal capacity for a few days can serve as the basis of an adjudication. While a decree is fixed in second feet, there is no limit in acre feet other than the general clause of benficial use (R. 1375).

All the water decrees are filed with the state engineer, since he is the administrative head of water distribution in the state, and all water is distributed in conformity with these records.

3. Development of Irrigation

Although hundreds of pages of the record and many exhibits are filled with interesting statistical information and comparisons concerning the settlement, agriculture, and population in both states, this material is omitted from any statement of fact for the reason that it has little bearing upon any solution of the need for water in the arid Arkansas basin in Western Kansas or in Eastern Colorado.

The development of farming operations, except for irrigation, was a gradually westward movement: Eastern Kansas was developed before Central Kansas; Central Kansas was developed before Western Kansas. Western Kansas, particularly with reference to its dry farming, has sustained its great impetus during the last 20 or 30 years. Dry farming areas in Eastern Colorado followed those in Western Kansas, and the greatest impetus there has been within the last 20 years. Great areas of tillable land have not as yet been settled on. These are susceptible to the same degree of cultivation and are susceptible to the same productiveness and dry farming conditions as are those in Western Kansas (R. 5027).

The two decades 1860 to 1880 saw the beginning of irrigation in Colorado. From 1860 to 1870 numerous small ditches developed near mining camps. These largely were close to the stream, irrigated small tracts, and such agriculture as existed was largely for the purpose of furnishing such crops as were needed to supplement the need of a mining population. By the year 1870, 30,000 acres, and by 1880, approximately 60,000 acres, of land were being irrigated on the headwaters of the Arkansas and on or near the heads of tributary mountain streams (R.

1563-64). But in the plains area of both states irrigation by means of the large ditches, diverting water from the main channel of the river, really started in the decade 1875 to 1885.

In the period prior to 1884 the arid area from Pueblo in Colorado to Garden City in Kansas saw the beginning of larger ditch construction for irrigation. By that date five ditches of considerable importance were commenced in that area in Colorado. These were, the Oxford Farmers in 1867, the Keesee in 1871, the Rocky Ford in 1874, the Jones in 1875, and the Lamar in 1875. In addition, however, the Catlin, the Rocky Ford Highline, and the Bessemer, all commenced after the beginning of 1884, did acquire some earlier small priorities of dates prior to 1884.

In Kansas the Garden City ditch was commenced in 1879, the Farmers Ditch in 1880, the Great Eastern in 1881, and the South Side in 1881.

Ditch construction continued in both states up until the early 1890's. The application of water to the land under these large irrigation enterprises in Eastern Colorado was slow. In Districts 14, 17 and 67, which comprise the counties of Pueblo, Otero, Crowley, Bent and Prowers, the great irrigation counties of the Arkansas Basin, the acreage under irrigation by 1889 amounted to only 33,390

acres, according to the census of that year (Kansas Exh. 52, page 1507).

In Kansas the irrigated acreage approximated 60,080 acres in 1896 (Kansas Exh. 115, page 2355). To bring the development of irrigated acreage to date in the four Colorado counties just referred to, the acreage under irrigation had increased to 212,341 acres according to the irrigation census of 1902 (Kansas Exh. 52, page 1507). The total irrigated acreage in the Arkansas Basin in Colorado, according to the census of 1939, amounted to 469,535 acres (Colorado Exh. 196, page 6556). In Kansas in the area between the state line and Garden City the amount of land under irrigation remained comparatively static, with only 56,341 acres under irrigation in 1939, but of this amount only 29,239 acres were still attempting to maintain irrigation without the use of supplemental water secured from pumping plants.

Following ditch development there came a period of reservoir development in Colorado. The first reservoir was completed in 1895, and water first used therefrom in 1896. One more, the Great Plains system, was completed before 1901. By 1910 eight more were completed. Nineteen more were added between 1910 and 1920, and four subsequently. Of these, two were washed out, leaving 31

with a decreed capacity of 521,506 acre-feet (Kansas Exh. 65, page 1543). In addition to these, the Caddoa Reservoir across the channel of the Arkansas River has been authorized to be built at government cost. This one reservoir has a contemplated capacity of 655,000 acre-feet, and a present completed capacity of 270,000 acre-feet. In Kansas one reservoir, Lake McKinney, was constructed and put in operation in 1909.

Transmountain projects capable of diverting approximately 250,000 acre-feet of water per year are contemplated, surveyed and under consideration by Colorado (R. 1453). Ultimately they might secure as much as 300,000 acre-feet (R. 1456).

4. Water Supply Available for Irrigation

> "The average annual natural flow of the River and its tributaries is 1,240,000 acre feet, of which the average annual dependable and fairly continuous water supply and flow of the Arkansas River and its tributaries is 1,110,000 acre-feet." (Master's Report, Finding of Fact Sixth, page 10.)

The foregoing fact is the result of the only determination of the complete water supply of the entire basin in Colorado, which appears in the record (R. 1442 to 1519; Kansas Exhs. 18 to 62, inclusive). This covers a 36-year period. The average dependable flow of 1,110,000 acre-

feet annually was arrived at by excluding excessively high water years, 1900, 1905, 1914, 1915, 1921 and 1923 (R. 1521), in line with the pronouncement of this Court made in the case of *Wyoming v. Colorado*, 259 U. S. 419, at page 476; 42 Sup. Ct. 552, at page 561. (See, also, Master's Finding of Fact Six.)

The character of this supply roughly falls into two classifications—First, the mountain runoff, largely resulting from melting snows in the high mountain areas, and impounded in those regions until released for use in the late spring and early summer; approximately 75 percent of the water supply falls in this classification, which is largely produced in conformity with irrigation needs during the summer months (R. 1419; Kansas Exh. 55, page 1510). Second, the remaining portion of the water supply, approximately 25 percent (Kansas Exh. 55, page 1510), is that which can be classified as plains runoff; this is largely the result of heavy rains on portions of the plains area. Precipitation in the plains area is largely erratic; runs off quickly without restraint (R. 1419). The contribution to stream flow follows almost immediately after the rain, and in many cases bears no relationship to the seasonal needs of crops for water. Colorado being the upper state, the irrigator in Kansas secures water from

river flow during the growing season, only when the needs of all Colorado irrigators have been satisfied or when reservoir storage is filled, or else when there is such flash flow in quantity for a few days in the River that (Colorado) canal capacities are insufficient to divert it either for irrigation or storage purposes (R. 1527).

The situation is well stated by State Engineer Hinderlider, who pointed out:

> "Practically all of the water escaping out of this valley into Kansas is the result of tributary flow entering the River in the lower reaches of the valley." (R. 1739.)

The day by day river flow recorded at the Kansas-Colorado line during the period from 1912 to 1931 is accurately portrayed by hydrographs (Kansas Exhs. 71 to 90, inclusive, pages 1618 to 1684). These show that out of 3,340 days making up the total of the growing season, 1905 days had a flow across the state line of less than 100 second-feet, and of these 1,359 days had a flow of less than 50 second-feet.

E. CONTROVERSY RESULTING FROM RIVER DEPLETION BY COLORADO

The controversy with respect to the waters of the Arkansas River has been of a continuous nature from 1901 down to the present. In 1901 the State of Kansas instituted suit in the Supreme Court of the United States against the State of Colorado, seeking to enjoin the diversion by the latter state of the water of the Arkansas River. Kansas claimed the right to the continual flow of the stream. Colorado claimed the right of ownership to all the waters arising within the state. The result was that the contentions of both parties were disapproved, and the court announced for the first time the doctrine of equitable apportionment of benefits of the water supply of an interstate stream. The case was "dismissed without prejudice to the right of the plaintiff (Kansas) to institute new proceedings whenever it shall appear that through a material increase in the depletion of the waters of the Arkansas River by Colorado, its corporations, or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionments of the benefits between the two states resulting from the flow of the river."

Following this decision, on or about August 27, 1910,

suit was instituted by the United States Irrigating Company in its private capacity against certain irrigation ditches in Colorado in their private capacity seeking to secure recognition through its facilities as against Colorado ditches diverting water. This case was dismissed after a contract had been entered into and a sum of money paid to the contracting parties, giving to them a decree as of the date of 1910. This contract had nothing to do with the question of the apportionment of the water supply between the states of Kansas and Colorado. The states of Kansas and Colorado were not parties to the contract. Furthermore, this contract was not consented to or approved by the State of Colorado nor by the State of Kansas (R. 5992). Neither was The Finney County Water Users' Association a party to this contract. On November 27, 1916, The Finney County Water Users' Association filed suit in equity in the United States District Court for the District of Colorado against Colorado ditches, seeking to compel recognition of a priority of 250 second-feet of flow as of the date of 1880. On January 23, 1923, the same character of action was filed in the same court against other ditches and reservoirs in Colorado. These cases are at present pending; and are the cases against which an in-

junction is sought in the present case to prevent their further prosecution.

In 1921 in Colorado, and in 1923 in Kansas, legislation was enacted providing for an interstate commission and the appointment of commissioners looking to settlement of the interstate controversies. Considerable work was done and investigations made almost entirely relating to the construction of a reservoir on the Purgatoire River in Colorado which might serve the purpose of storing water for use in Kansas. These compact negotiations failed for various reasons, but, as Mr. Knapp testified, this compact met with rather determined opposition from two sources in Colorado: First, from the canals on the main stream below the mouth of the Purgatoire that then were enjoying the waters of the Purgatoire who would be deprived of such waters; and second, from the interests on the upper portion of the Purgatoire, because of the fact that the proposed compact would prohibit the building of any further reservoirs on the Purgatoire by Colorado interests above Trinidad except for municipal purposes (R. 5288). As a matter of fact neither Colorado nor Kansas approved the report of the commissioners appointed by both states to investigate the matter.

F. MASTER'S REPORT

On May 24, 1943, the Special Master appointed by this Court filed his report and recommendations, and on the basis of his consideration and a review of the entire record found the main issues as follows:

(a) That the real issue involved in the present case is the equitable apportionment of the water supply of the Arkansas River and its tributaries in such manner as to secure as nearly as possible to each state irrigation without depriving either of the beneficial effects of a flowing stream, and to grant to each state relief and protection of their equitable portion of the water supply with certainty and definiteness as to the quantity, continuity and character, as is measured out to them at a definite place, so that delivery can be compelled. (Conclusion of Law One, page 14.)

(b) That since the taking of testimony in the case of *Kansas v. Colorado*, 206 U. S. 46, there has been a material increase in the river depletion by Colorado of the water supply of the Arkansas River, which has been consumed and used by Colorado users for irrigation purposes, and which has diminished the flow of the water into the State of Kansas, and for that reason there have been injuries to

the substantial interests in Kansas. (Finding of Fact Five, page 9.)

(c) That the average annual dependable water supply of the Arkansas River amounted to 1,110,000 acre-feet. (Finding of Fact Sixth, page 10.)

(d) That of the average annual dependable water supply of the basin an award was made of 925,000 acre-feet or five-sixths to the State of Colorado and 185,000 acre-feet or one-sixth to the State of Kansas. (Findings of Fact Eighth and Ninth, pages 10 and 11; Conclusions of Law Two and Three, pages 14 and 15.)

(e) That the water supply allocated to each of the states was to be computed daily, through the use of two index stations, one reflecting the plains runoff and the other the mountain water supply, the water measured at such stations, varying up or down as the two types of water supply in the basin varied, so that the benefits of wet years and the burden of dry years would be borne in the same proportion by the two states. (Master's Finding of Fact Twelve, Conclusions of Law Five, Decree Four.)

III. Specifications of Exceptions to Master's Report to Be Urged Herein

The printed exceptions to the Master's Report filed herein cover 25 pages, the length largely necessitated by reprinting in full the specific findings of the Master with the corrections thereto which form the basis of the majority of the exceptions. We presume that the purpose and intent of Rule 27 (d) will be served by presenting at this point in the brief a summary of the exceptions to be urged herein without reprinting them in full.

Defendants wish to emphasize that the exceptions so filed are not directed to any of the basic Findings or Conclusions of the Special Master. They are rather directed to:

A. The clarification of language used therein, to insure an adequate administrative protection of the apportionment of the water supply awarded by the Special Master to Kansas, and prevent misinterpretations which would lead to disputes and further litigation; and

B. Requesting additional findings of fact, which defendants feel are desirable to be brought to the attention of this court for a more complete understanding of the facts which the Special Master had before him, and upon which the Report of the Special Master has been based.

A summary of the exceptions follows, and page references made are to the pages of the defendants' printed exceptions:

First. The Special Master erred in inadvertently using language which makes it appear that he has found as facts certain physical characteristics of the basin which are contrary to the undisputed evidence.

A. In finding that tributaries to the River contribute measurable quantities which increase gradually from Pueblo to Dodge City, Kansas (Exception 2, page 3).

B. In finding that the general character of the River and valley are practically uniform from where the River emerges from the Rocky Mountains to a point 200 miles east of the western border of Kansas (Exception 1, page 1).

Second. The Special Master erred in failing to make certain additional findings of fact which defendants believe are essential for a complete consideration of the Master's Report. These are as follows:

A. That under natural conditions, and without the aid of irrigation, the per-acre yield in the arid areas of Kansas and Colorado are substantially equal (Exception 4, page 4).

B. That the extent of land which could be irrigated in

Kansas from ditches and laterals heretofore constructed amounts to approximately 414,000 acres, the development of which was rendered impossible by Colorado's water diversion (Exception 6, page 6).

C. Colorado being the upper state has the first opportunity to divert and use the waters of the Arkansas River for irrigation purposes, and has so diverted and used said waters to the extent that the users in Kansas have been deprived of practically all of the dependable flow of the stream. Such water as at present passes the state line into Kansas consists of flash floods of a day or a few days' duration, most of which is not subject to diversion or use. Water which can be captured from such floods is intermittent and bears little or no relation to crop requirements (Exception 7, page 7).

D. That with the construction of the channel reservoir known as Caddoa Reservoir, now completed to the extent of 270,000 acre-feet of capacity and with the ultimate storage capacity of 655,000 acre-feet, the larger portion of the water supply hitherto passing across the state line into Kansas can be captured and conserved in said Caddoa Reservoir (Exception 3, page 3).

Third. The Special Master erred in failing to use clear, concise and unambiguous language in Findings of Fact

8, 9 and 12, his Conclusions of Law 2, 3, 5 and 9, and in the Recommended Decree at paragraphs 1, 2, 4 and 8, which would make impossible misinterpretation of the manifest intent of the Special Master in the equitable distribution of the water supply and its delivery to Kansas in the following particulars:

A. In making the finding that of the average annual dependable supply of 1,110,000 acre-feet, 925,000 should be allocated to Colorado and 185,000 to Kansas, the Master should have likewise designated the percentage of the average annual dependable supply, namely 83.33 percent to Colorado and 16.67 percent to Kansas in order that the ratio of apportionment could be preserved in the distribution of the water supply as it originates. (Exceptions 8, page 8; Exception 9, page 9; Exception 11, page 15; Exception 12, page 16.)

B. That the language of Finding of Fact 9 should be made to conform to paragraph 2 of the proposed Decree in order that the delivery of all of the water allocated to Kansas should be made when and as required by the water officials of the State of Kansas (Exception 9, page 9).

C. That in Finding of Fact 12, Conclusion of Law 5, and paragraph 4 of the Proposed Decree, the Master, in

using two gauging stations as an index for computing the basin water supply as it originates, and thus providing for the apportionment and delivery, should have shown that the water passing such stations represents only a part of the water supply of the basin, and should have clearly set forth the formula through which such determination of total water supply available should be made. He should have stated therein that the recorded flows of water passing such two stations, which serve as an index from which may be computed for the purposes of apportionment of the total water supply of the basin, constitutes fifty-four percent (54%) of the water supply of the basin, and that 30.87 percent of the water passing such stations, which is 16.67 percent of the total basin water supply, shall be the amount which accrues to Kansas as its equitable share, and which is subject to delivery at the state line; thus, insuring a delivery to Kansas of that portion of the water supply found to be Kansas' equitable share (Exception 10, page 11; Exception 13, page 17; Exception 3 to the Proposed Decree, page 22).

IV. ARGUMENT

A. THE PRINCIPLE OF LAW CONTROLLING THIS CASE

The fundamental issue raised by the pleadings in this case is a determination of the equitable apportionment of the waters of the Arkansas River as between the two states. Kansas in its answer for affirmative relief has asked that the court protect and quiet the rights of the State of Kansas to the use of water from the Arkansas River, and that Colorado, its officers, agents and employees, and all residents or citizens of Colorado, shall be perpetually enjoined from diverting water from the Arkansas River or its tributaries to the injury of the rights of the State of Kansas. Colorado in its answer asks that the State of Colorado and its ctizens may be quieted in their diversion, use and employment of the waters of the Arkansas River.

The principle of law upon which the determination of the issues in this case must be based is clear. The pioneer case which declared the principle of law governing the relationship of states to the waters of an interstate stream was *Kansas v. Colorado*, 206 U. S. 46; 27 Sup. Ct. 655. In that case the State of Kansas sought an injunction to re-

strain the State of Colorado, acting directly herself as well as through private persons thereto licensed, from depriving or threatening to deprive the State of Kansas and its inhabitants of all the water theretofore accustomed to flow in the Arkansas River. The State of Colorado claimed complete ownership of all waters arising within the state, and the right to utilize them as it saw fit. In that case the claims of these states were diametrically opposed. As stated by the court:

> "Turning now to the controversy as here presented it is whether Kansas has a right to the continuous flow of the waters of the Arkansas River as that flow existed before any human interference therewith, or Colorado the right to appropriate the waters of that stream so as to prevent that continuous flow . . . If it is diminishing that flow, has it an absolute right to determine for itself the extent to which it will diminish it, even to the entire appropriation of the water?" (206 U. S. at page 85.)

The contentions of both parties were rejected by the court, and for the first time the principle was announced that as between two states on an interstate stream there should be an equitable apportionment of the benefits resulting from the flow of the stream. The case was dismissed without prejudice. The court stated:

> "The decree will also dismiss the bill of the State of Kansas as against all the defendants, without prejudice to the right of the plaintiff to institute new proceedings whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river." (206 U. S. at page 117.)

This principle of law was followed in *Wyoming v. Colorado*, 259 U. S. 419; 42 Sup. Ct. 552. There the court for the first time applied the doctrine by prescribing the quantity of water to which the State of Colorado was equitably entitled to use as against the interests of Wyoming. The court there stated, at page 558:

> "The contention of Colorado that she as a state may rightfully divert and use, as she may choose, the waters flowing within her boundaries in this interstate stream, regardless of any prejudice that this may work to others having rights in the stream below her boundary, cannot be maintained. The river throughout its course in both states is but a single stream, wherein each state has an interest which should be respected by the other."

The same principle was applied in the case of *Connecticut v. Massachusetts*, 282 U. S. 660; 51 Sup. Ct. 286.

Following this, in the case of *State of New Jersey v. State of New York*, 283 U. S. 336; 51 Sup. Ct. 478, at page 479, the court said:

> "Different considerations come in when we are dealing with independent sovereigns having to regard the welfare of the whole population and when the alternative to settlement is war. In a less degree, perhaps, the same is true of the quasi-sovereignties bound together in the Union. A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it. New York has the physical power to cut off all the water within its jurisdiction. But clearly the exercise of such a power to the destruction of the interest of lower states could not be tolerated. And on the other hand equally little could New Jersey be permitted to require New York to give up its power altogether in order that the river might come down to it undiminished. Both States have real and substantial interests in the River that must be reconciled as best they may. The different traditions and practices in different parts of the country may lead to varying results but the effort always is to secure an equitable apportionment without quibbling over formulas."

One of the late cases where this same principle was referred to and applied is the case of *Hinderlider v. La Plata River and Cherry Creek Ditch Company*, 304.

U. S. 92; 58 Sup. Ct. 803, at page 807 of which the court states:

> "First. As the La Plata River flows from Colorado into New Mexico and in each state the water is used beneficially, *it must be equitably apportioned between the two.*"

It will be noted that in the development and application of the doctrine as first announced, equitable apportionment of the benefits has been more definitely defined by the Supreme Court in its later cases as an equitable apportionment of the water.

The equitable division of the water supply of the Arkansas River between Kansas and Colorado here is before this court for the first time.

Because there is little room for argument as to the law of the case, it is apparent that the cause before the court is one of equity based upon a consideration of facts.

Under these declarations of law two problems are presented to the court for final determination—First, to adjudicate to each state that portion of the water supply to which it may be equitably entitled, and with respect to which each state may in its sovereign capacity obtain the full benefit thereof; and second, it is for the court to define the rights of each state with respect to the use of water with such definiteness that adequate administra-

tion of the water supply can be had, and adequate protection afforded to insure a delivery to the lower state (Kansas) of its adjudicated share without infringement of that amount by upper state users.

Defendants wish to again emphasize that as to the determination of the fundamental issues of this case made by the Special Master we have no complaint, nor are defendants' exceptions directed thereto. The Master has found that since the taking of testimony in the case of *Kansas v. Colorado*, 206 U. S. 46, a material increase in the River depletion by Colorado of the water supply of the Arkansas River, which has been consumed and used by Colorado users for irrigation purposes, has diminished the flow of the water into the State of Kansas, and that by reason thereof there has been injury to the substantial interests of Kansas (Master's Report, Finding 5, page 9). This was adequately supported by evidence of comparison of years of similar water supply (Kansas Exh. 62, page 1519; Kansas Exh. 70, page 1569), and evidence that since the close of testimony in the original Kansas-Colorado suit consumption of water in Colorado has increased to the extent of 300,000 acre-feet of the average yearly dependable water supply (R. 1742), and that the Colorado average consumption

during the 11 years, 1920 to 1930 was approximately 95 percent of the dependable supply (R. 1521). The Master likewise found that the average annual dependable, and fairly continuous, water supply of the Arkansas River and its tributaries is 1,110,000 acre-feet (Master's Report, Finding of Fact 6, page 10). This was amply shown by the only complete water supply record in evidence (R. 1442 to 1519; Kansas Exhs. 18 to 62 inclusive).

The Master likewise, from a consideration of all the evidence, determined the fair and equitable apportionment of the water supply of the basin, allocating to the State of Colorado 925,000 acre-feet and to the State of Kansas 185,000 acre-feet of the average annual dependable water supply (Master's Report, Findings 8 and 9, pages 10 and 11; Conclusions of Law 2 and 3, pages 14 and 15; Recommended Decree 1 and 2, pages 19 and 20). This amounts to an apportionment of one-sixth to Kansas and five-sixths to Colorado.

Defendants here suggest that the 185,000 acre-feet allocated by the Special Master to Kansas is a considerable decrease from the average of 260,000 acre-feet which Colorado's Exhibit 209, page 6640, shows was the average annual amount which passed across the state line into Kansas during the period 1908 to 1938. Because of this

fact defendants are reluctant to accept this small apportionment. Defendants have not excepted to this apportionment because it appeared that the manifest intent of the Special Master's Report and proposed decree was to provide a delivery of the same in accordance with irrigation needs, and upon the demands of Kansas state water officials, thus converting a larger gross unusable supply into a lesser quantity of usable irrigation water. We here again suggest that the exceptions directed to the Master's Report are confined either to clarification of language, which clearly protects the delivery of the small portion allocated to Kansas, so that it will be available in conformity with irrigation needs, or to requests for additional findings of fact from evidence which the Master clearly accepted, but which he did not reduce to express findings, and which defendants believe are essential to an understanding by this court of the absolute necessity for proper delivery and adequate protection of the small quantity of water apportioned to Kansas.

B. THE ARID AREA IN KANSAS IS SOLELY DEPENDENT UPON THE WATER SUPPLY FROM COLORADO FOR THE PRACTICE OF IRRIGATION

(Relating to Exceptions 1 and 2)

The basis for the foregoing statement is found in the physical characteristics of the River Basin in Colorado and Western Kansas. We are dealing here with an arid region. Where the rainfall is below 20 inches, that area is arid. Below 20 inches of rainfall must be supplemented to carry on agriculture in a satisfactory manner. (R. 2263.) With respect to a line of demarcation, west of which irrigation should be practiced, in irrigation literature the line has frequently been set at the 100th meridian which passes through Dodge City, or at the line of 20 inches of rainfall on the great plains (R. 1416).

In the Arkansas River basin to the west in the mountainous area in Colorado annual precipitation runs above 20 inches. This is reflected by mountain recording stations where the average annual rainfall is, such as Lake Moraine, 24.70 inches—47 year record; La Veta Pass, 22.29 inches—33 year record; and North Lake, 22.74 inches—45 year record. To the east of Dodge City in Kansas precipitation runs from 20 inches to something more than 30 inches. Thus, there is an area of precipita-

tion below the 20-inch rainfall belt lying generally east of the mountains in Colorado and west of a line drawn north and south through Dodge City.

This region in the two states under scrutiny lies in the arid region of the United States, part in Kansas and part in Colorado. It has been so classified by the United States government in its classification of land areas in the United States (R. 372). In this arid area rainfall deficiency makes irrigation necessary for the production of certain crops, and necessary for the securing of satisfactory yields of any crop (R. 2262). For this reason it is important that the fact be made clear that the Kansas arid region has no substantial source of water for irrigation purposes other than that flowing into Kansas from Colorado. The record clearly shows that in the 200 mile stretch of River from the Kansas-Colorado line eastward to approximately Larned there are no entering tributaries except for a few small dry arroyas (Colorado Exh. 6, R. page 35). From the Kansas-Colorado line east to Kinsley, Kansas, there are no tributaries which might supplement the stream flow in the Arkansas River whatever (R. 2268). Kinsley is located approximately 160 miles east of the state line and approximately 200 miles east by river channel. There are no live tributaries entering the stream until Larned.

Kansas, is reached (R. 1495). Larned is located approximately 190 miles east of the Kansas-Colorado line and 230 miles east by river channel (R. 1495). These facts are uncontroverted in the record.

While the Master has found as a fact, in the last paragraph of the Second Finding of Fact, that "The lands in Kansas attempting to practice irrigation are dependent upon the flow of the Arkansas River which comes into Kansas from Colorado," the previous sentence, "The general characteristics of the River and valley and country adjoining are practically uniform from the point where the River emerges from the Rocky mountains to a point about 200 miles east of the western border of Kansas," is misleading, as it inferentially would indicate that the large number of tributaries which enter the River from both sides in Colorado (Colorado Exh. 6, R. p. 35) likewise exist in the arid region in Kansas, a fact contrary to the record. In order to clarify this situation defendants' first exception, page 1, requests that the words "except that in that portion of the River and valley lying in Kansas there are no entering tributaries except for a few small dry arroyas" be inserted after the last quoted portion of the paragraph, for the sake of a clear understanding of the facts.

To the same effect is defendants' Exception II, page 2, to the first paragraph of the Third Finding of Fact. The Master there states, "The tributaries to the River contribute water in measurable quantities, which is due to rainfall, surface runoff, and seepage return water from irrigation, and in some instances from melting snows in the mountains, and gradually increases from Pueblo, Colorado, to Dodge City, Kansas." Since there are no tributaries in Kansas from the state line to Dodge City (Larned, where the first tributary enters, is located considerably to the east), there can be no contribution of water from any tributary source whatever, and a deletion of the ambiguous phrase "and which increases gradually from Pueblo, Colorado, to Dodge City, Kansas" is essential for a correct understanding of the true situation.

C. RELATIVE NEED FOR WATER IN CROP PRODUCTION IN THE TWO STATES

(*Relating to Exception 4*)

A primary factor for consideration in determining equitable apportionment is an understanding of the need for supplemental water in crop production in the arid area of Kansas and Colorado. This is induced by the allegation made by Colorado in its reply, "The land situated in the Arkansas River drainage basin within

the State of Colorado is dry, barren and unproductive in its natural state." This allegation is entirely disproved by the undisputed evidence to the effect that per-acre yields under natural conditions or dry farming in the two comparative areas are on a substantial parity.

There is a tendency to base judgment respecting the need for water purely upon the difference in average annual precipitation, wrongfully assuming that a lesser precipitation in one area indicates a greater need for water for crop production than in an area where precipitation is somewhat higher. This, however, is utterly unsound, since it fails to take into consideration other factors, such as daily and monthly distribution of rainfall in conformity to plant growth needs, the effect of higher temperatures and greater wind velocities, which operate to substantially affect the utility of rainfall for plant growth because of evaporation, and the character of soil which may or may not protect precipitation from the effects of evaporation. All are factors that must be studied, and in the final analysis answered by the actual results of crop production disclosed by the yields per acre under natural conditions in the two arid areas under consideration.

The Master in his report (Finding of Fact Third, page 7), in the third paragraph, found:

> "Precipitation, melting snows, temperature, evaporation and wind velocity, and the character of the soil appear to be factors which are interrelated in crop production and of sources of water supply of the Arkansas River, . . . The mean average annual temperature in the Colorado area ranges from two to five degrees lower than in Kansas area and in Western Kansas the wind velocities are higher than in the eastern region in Colorado, which has an effect upon evaporation. The soils in both Colorado and Kansas areas are well suited to irrigation, but the character of the soil in Kansas area, which contains more silt than in the Colorado area, will hold larger quantities of water without loss by deep percolation."

The Master's Report, however, is silent on the comparative crop yields per acre resulting from these interrelated climatic factors which he has referred to. Since resultant yields are necessary for an understanding by this court of the true picture of crop production under natural conditions, the defendants have requested, in Exception Four at page five, that the following fact be added to the last quoted portion of the Master's Report:

> "The fractionally greater monthly precipitation in the Kansas area is largely dissipated by the greater evaporation, so that the beneficial effect of precipitation on plant growth in both areas is sub-

stantially equal. The result is that crops under natural conditions without the aid of irrigation produce substantially the same yields per acre in eastern Colorado as in western Kansas."

This requested finding of fact is supported by undisputed evidence obtained through comparison of crop yields in the arid regions of both states. Crops are not grown with average rainfall. (R. 2261.) The amounts of the yields of various crops, or the ability to raise them at all, depends entirely upon the soil moisture available during the growing season in the particular year in which the crop is grown. For this reason monthly and even more important daily precipitation is the only basis for the determination of the relationship of precipitation to agriculture (R. 2273).

Although the difference in monthly precipitation is only a fraction of an inch per month in favor of the Kansas area (Kansas Exh. 12, page 1414), other factors enter into the picture, such as condition of the soil at the time of rainfall, the rate of evaporation, temperatures, and wind velocities, all of which play an important part in reducing the values to plant growth of the actual precipitation (R. 2274). The two percent to five percent higher temperatures and the higher wind velocities in the Kan-

sas area, as found by the Master, vitally affect plant growth. Wind velocity and temperature go to bring about evaporation (R. 2287). Higher wind velocities and higher temperatures make for relatively higher evaporation. Evaporation subtracts from precipitation an amount of moisture which is lost to plant growth.

The effect of all of the foregoing factors operating together is found in a study of the actual yield per acre of similar crops grown under natural conditions without irrigation.

Comparisons show that in crop production under natural conditions the two areas, Eastern Colorado and Western Kansas, are substantially on a parity. A comparison of crop yields in two comparable areas in Kansas and Colorado, where agriculture is practiced under natural conditions, that is, mere cultivation of the soil without the aid of any supplemental water supply, has been made. Kansas Exhibits 102, 103 and 104, pages 2294 and 2295, present such a comparison.

In making this comparison similar areas were selected in both states, reaching east of the state line 102 miles, and west of the state line 108 miles, containing 10,890 square miles in Kansas and 11,350 square miles in Colorado, all symmetrically located along the Arkansas River

as an east and west axis (R. 2291; Kansas Exh. 102, page 2294.)

By comparing a tier of counties north of the River and south of the River in Kansas with a corresponding tier of counties in Colorado, and excluding the tier of riparian counties along the River so that no benefits from irrigation are reflected, the actual yield per acre of crops grown under natural conditions speaks for itself. Production in those areas is the result of dry farming enterprise alone.

Comparison of crop yields in these groups over the period 1921 to 1930 for which comparable records are available show that crops raised in this arid region in Kansas and Colorado without benefit of irrigation are strikingly similar (R. 2299; Kansas Exhs. 103 and 104, page 2295). The main crops grown in these two areas are winter wheat, corn, oats, barley, rye, grain sorghums, and broom corn. In the comparison made identical crops were considered for both areas, and in the counties lying north of the river in Kansas constituted 95.5 percent of the total crop acreage, and in Colorado 95.3 percent of the total crop acreage. In the tier of counties south of the River the crops studied constituted in Kansas 98.7 percent of the total in crops, and in Colorado 97.8 percent.

A comparison in yields in bushels per acre in the two

areas over the 10-year period 1921 to 1930 indicates that production under natural conditions was substantially the same (R. 2313-18). Statistics for the same period with respect to two of the Colorado counties lying nearest the mountains, where the average annual rainfall was only between 11 and 12 inches indicated the same identical situation. For the sake of brevity we submit a summary of the comparisons heretofore referred to:

Area	*Average Annual Rainfall, inches*	*Crops* — *Winter Wheat*	*Corn*	*Oats*	*Barley*
		Yields per Acre in Bushels			
Kansas:					
North of River Tier.....	15½ to 19	8.74	13.70	15.2	15.36
South of River Tier.....	15½ to 19	10.6	15.58	14.95	14.06
Colorado:					
El Paso County	11.23	13.1	14	19.1	15.6
Pueblo County	11.98	9.9	12.6	14	13.4
North of River Tier.....	13 to 15	8.65	13.60	14.95	13
South of River Tier.....	13 to 15	8.1	11.9	12.5	11.80

The fact that the area devoted to dry farming in Colorado is less than that in Western Kansas is easily accounted for by two main factors: First, the westward course of land settlement, and development of Western Kansas, before Eastern Colorado; and, Second, the emphasis placed on irrigation in the Colorado area because as long as a primary diversion opportunity existed, and water could still be captured, the higher rewards and returns incident thereto did not force development of a dry farming

area, until the usable water supply had been completely depleted. The opportunities, however, for such dry land farming development are shown by Kansas Exhibit 105, which indicates that land available for dry farming in 1929, was in: Baca County, Colorado, 968,045 acres suitable for dry land agriculture, with 252,485 in crops; Cheyenne County, Colorado, 845,820 acres suitable for dry land agriculture, with 107,050 in crops; and Kiowa County, Colorado, 746,389 acres suitable for dry land agriculture, with 83,770 in crops. The crop acreage in these three counties had increased since 1921 by 89,093.

Kansas Exhibit 109 shows with respect to the four crops of winter wheat, corn, oats, and barley, that in 1930: Elbert County with dry farming land amounting to 352,362 acres has 95,670 acres in these four crops; El Paso County with 217,010 acres had 63,820 acres in these four crops; and Lincoln County with 909,372 acres of dry farming land had 154,650 acres in these four crops. In the 13 counties east of the mountains lying in or partly in the Arkansas River basin there were 777,890 acres in 1929 devoted to dry land agriculture of the four crops above named. The acreage in grain sorghums amounted to 164,790 acres (R. 1862). This would raise the foregoing total to 942,680 acres. Broom corn is not

reflected in these figures for lack of statistical information, although it is one of the very best crops adapted to dry land agriculture, and we can assume that if the broom corn statistics were available the actual acreage producing dry farm crops in the 13 counties might well run over 1,000,000 acres.

We suggest that when yields are shown to be substantially the same in this arid region, whether located in Kansas or Colorado, it is certainly demonstrated that the equity of need for a supplemental water supply in the two areas, when balanced, one against the other, is substantially equal in both states. It is not maintained that these comparisons indicate that dry land farming in either area can be classified on the basis of successful agriculture, but they do demonstrate an equality of handicap, and that the need for a distribution of the benefits of a supplemental water supply from the Arkansas River is substantially the same. In the light of the foregoing facts the allegation of the State of Colorado in its reply at page 41, that, the land situated in the Arkansas River drainage basin in Colorado is dry, barren, and unproductive in its natural state, is without foundation in fact. In the face of the record the testimony of State Engineer Hinderlider for Colorado, that irrigation is an absolute

necessity where precipitation is below 15 inches (R. 152), has been disproved by Colorado farmers. When Witness Patterson for Colorado was asked this question: In Eastern Colorado along the Arkansas River would it be possible to raise crops without the existence of these irrigation systems and application of water to the land? His answer was, "No it would not." (R. 421.) He further testified that the line of irrigation is the east line of Colorado and the west line of Kansas (R. 421), and that rainfall does not directly contribute to the raising of crops along the Arkansas River in Colorado (R. 423). Such testimony in the face of 1,000,000 crop acres producing per acre yields substantially the same as Western Kansas needs no further comment.

In concluding this portion of the brief we venture to suggest that the observations of the Supreme Court of the United States in the Kansas-Colorado case in 1901, namely, "and it would seem almost certain that reliance upon mere cultivation of the soil would not have anything like the effect in Colorado that it has had in Kansas, and that barrenness which characterized portions of this territory of Colorado would have continued for an indefinite time unless relieved by irrigation," has been shown by subsequent agricultural development to be erroneous.

D. DEVELOPMENT OF KANSAS IRRIGATION OPPORTUNITIES RENDERED IMPOSSIBLE BY COLORADO USE

(Relating to Exception 6)

Although the Special Master in Finding Fourth at page 8 has stated:

> "Both states from their beginning have recognized the need of water for irrigation and the using for that purpose of the public waters in their states."

and again in Finding Nine at page 11 has stated:

> "The irrigated acreage in the State of Kansas of the water supply of the Arkansas River and its tributaries is 65,028 . . ."

the report is silent as to the extent of the acreage under constructed irrigation projects in Kansas, which could have been developed but for Colorado water depletion. Because of this defendants have requested the following additional finding:

> "That the extent of land which could be irrigated in Kansas from ditches and laterals heretofore constructed, amounts to approximately 414,000 acres, the development of which was rendered impossible by Colorado's water diversions." (Exception 6, page 7.)

When there is under investigation two areas where both are dependent upon a limited water supply, in which

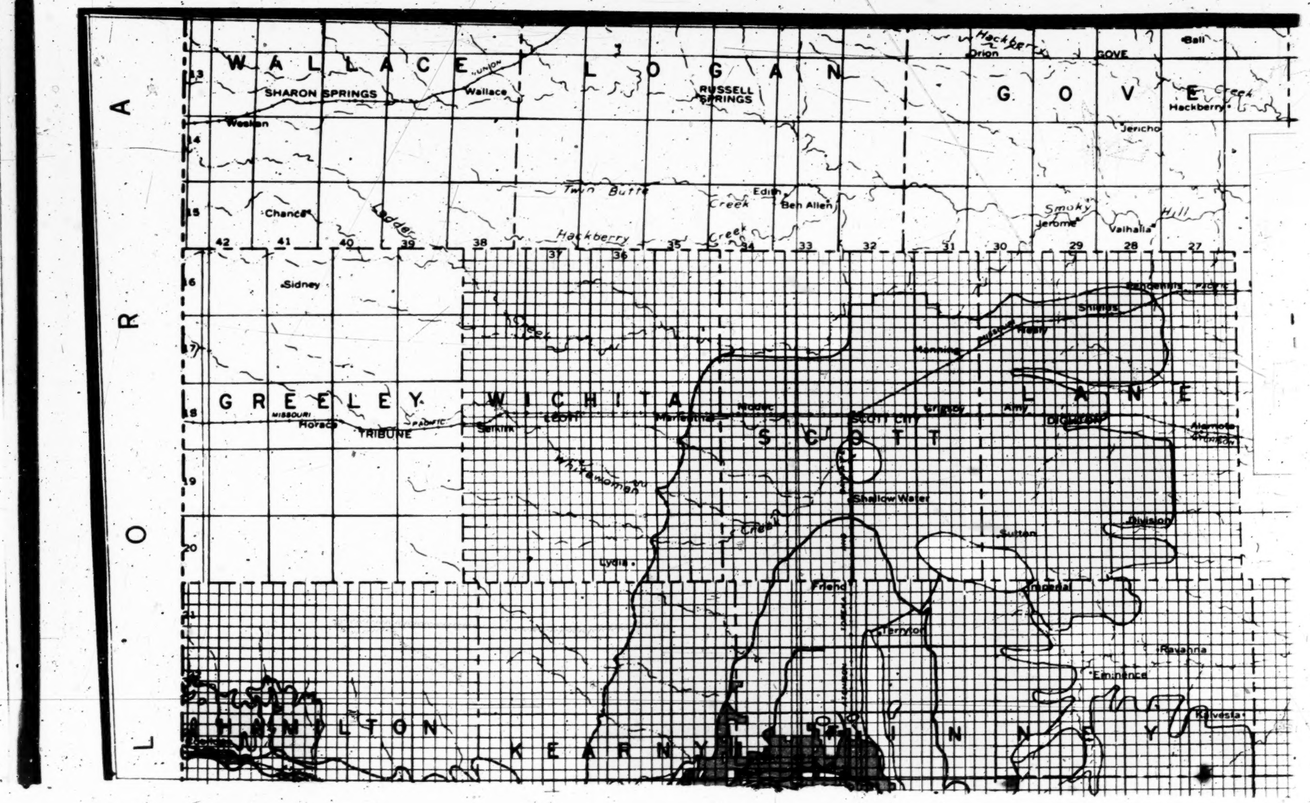
the upper area—in this case, Colorado—has a primary opportunity and an unrestricted exercise of that opportunity, and where the lower state—in this case, Kansas—is left with only a residual opportunity to make use of such water as escapes from the upper state unused, the extent of development forms no true basis for weighting equities. The reason for this is that, although in the beginning the opportunity for development may have been equal, every exercise of the opportunity by the upper state and every increase in development by the upper state correspondingly subtracts from the opportunity of the lower state to develop.

Prior to the year 1884 the following more important ditches, or their predecessors with respect to water rights, were commenced in the plains region in Colorado: The Rocky Ford, the Jones, the Catlin, the Rocky Ford Highline, the Oxford Farmers, the Bessemer, the Kessee, and the Lamar. The quantity of water allocated to these ditches as of that time represented a total of only 331.46 second feet (Kansas Exh. 92). This represented only a very small amount of the more than 6,000 second feet subsequently decreed to these and other major ditches in these same districts in Colorado.

On the other hand, in Kansas prior to 1884 the Garden

City Ditch, the Farmers Ditch belonging at present to The Finney County Waters Users' Association, the Great Eastern, and the South Side Ditch, were put into operation and water applied to beneficial use for irrigation purposes. Thus, with respect to the early efforts to apply water to beneficial use for irrigation by these ditches it can hardly be said that use to the full extent of the decrees of the Colorado ditches prior to 1884 would form any substantial diminution in the water supply available for Kansas use.

Not only was there a recognized need for water in the area in Western Kansas running 130 miles east of the Colorado line, but ample land was available for its practice. This land was ideally situated for the practice of irrigation by direct diversion from the one source of supply for such purpose, the Arkansas River. Kansas Exhibit 110, which is hereto attached, is a map showing the lands in Western Kansas lying north of the River which are at present irrigable, lands which were or could have been irrigated from ditches and laterals which were built. The extent of the land which could have been irrigated from the ditches and laterals referred to above, which were built, amounted to 414,000 acres, a development which undoubtedly could and would have taken place ex-



KANS. EX. 110

MAP OF ARKANSAS RIVER BASIN IN WESTERN KANSAS

SHOWING

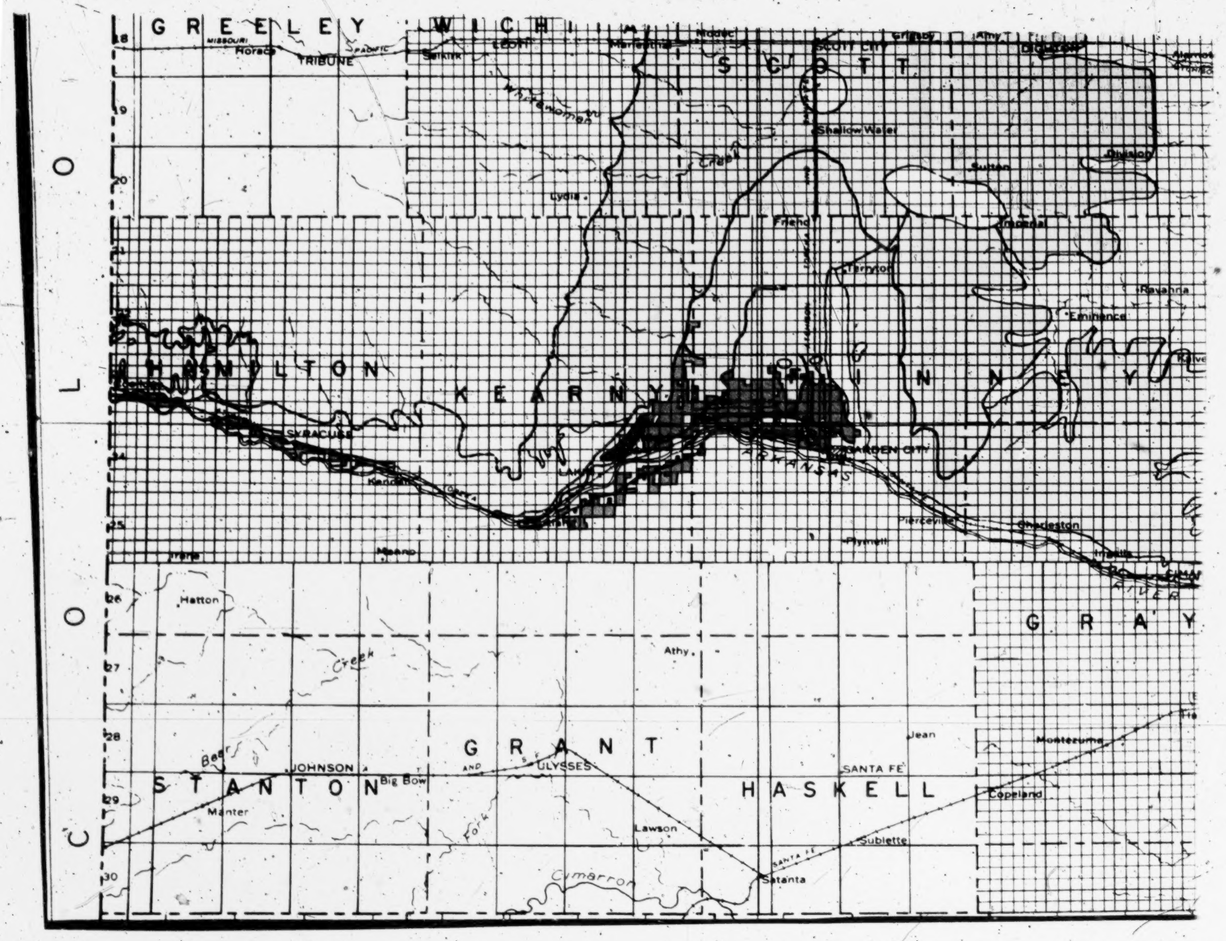
IRRIGATED LANDS-ABANDONED PROJECTS-IRRIGABLE LANDS

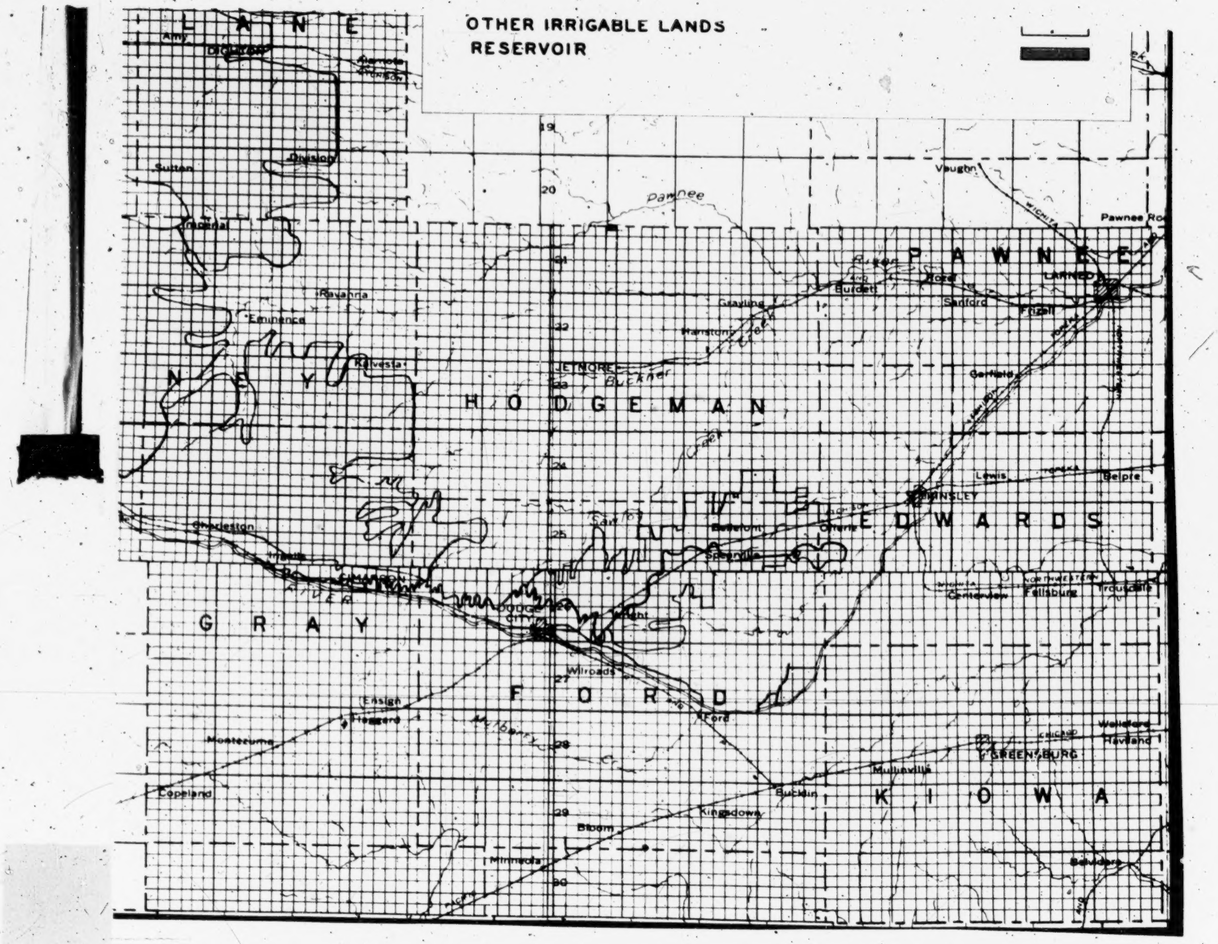
LAND IRRIGATED DURING 1931

IRRIGABLE LANDS UNDER ABANDONED DITCHES

OTHER IRRIGABLE LANDS

RESERVOIR


GREELEY
WICHITA
SCOTT
HAMILTON
KEARNY
FINNEY
GRAY
STANTON
GRANT
HASKELL
COLO
Horace
TRIBUNE
Salkirk
Marienthal
Modoc
SCOTT CITY
Grigsby
Amy
DIGHTON
Alamota
Whitewoman
Creek
Shallow Water
Sutton
Division
Lydia
Friend
Imperial
Terryton
Ravanna
Eminence
SYRACUSE
Kendall
LAKIN
GARDEN CITY
ARKANSAS
Pierceville
Plymell
Charleston
Ingalls
Irene
Manno
Hatton
Athy
Creek
Bear
JOHNSON
Big Bow
ULYSSES
SANTA FE
Jean
Montezuma
Manter
Lawson
Sublette
Copeland
Satanta
Cimarron
Fork


OTHER IRRIGABLE LANDS
RESERVOIR
LANE
Amy
DIGHTON
Alamota
Sutton
Division
Imperial
Ravanna
Eminence
Kalvesta
NEY
HODGEMAN
PAWNEE
Vaughn
Pawnee
Burdett
Rozel
Sanford
Frizell
LARNED
Grayling
Hanston
JETMORE
Buckner
Garfield
Lewis
Belpre
KINSLEY
EDWARDS
Charleston
Ingalls
CIMARRON
Belfont
Spearville
Centerview
Fellsburg
Trousdale
GRAY
DODGE CITY
Wright
Wilroads
FORD
Ensign
Haggard
Montezuma
Copeland
Mulberry
Ford
Buckin
Kingsdown
Bloom
Minneola
Mullinville
GREENSBURG
KIOWA
Wellsford
Haviland
Belvidere

cept for Colorado diversions. This exhibit shows in addition in the area north of the River alone approximately 1,000,000 acres which could have been reached by ditches and laterals north of the River, with probably an equal amount of desirable land lying south of the River (R. 2339).

We thus find in this early period development going forward in the plains area of both states. In Colorado, although water rights were adjudicated in different districts, protection of the earlier users was afforded by state administration, and the taking of water from the stream controlled in the order of the priority date.

The protection which the Colorado administration afforded lower water users with early decrees against upper water users with later decrees stopped at the state line. The early development in Kansas, although substantially the same in time and occurring before any substantial acreage was placed under irrigation in Colorado, was left without any protection to their earlier application of water to beneficial use. With ever increasing water consumption by the upper state senior priorities in a lower state find the dependable water supply gradually lessened until practically exhausted by junior priorities in an upper state (R. 1366).

E. EXTENT OF WATER DEPLETION BY COLORADO AND CHARACTER OF WATER SUPPLY REMAINING

(Relating to Exception 7)

Although the Special Master made the following finding (Finding 5 at page 9):

> *"Depletion by Colorado Of The Water Supply Of The Arkansas River Since The Taking of Testimony In The Case of Kansas Against Colorado Decided in 1907.* There has been since the taking of testimony in the case of Kansas against Colorado cited in 206 U. S. 46, in 1907, a material increase in the river depletion by Colorado of the water supply of the Arkansas River, which has been consumed and used by Colorado users for irrigation purposes and which has diminished the flow of the water into the State of Kansas and that by reason thereof there has been injuries to the substantial interests in Kansas."

a complete understanding of the existing situation, and of the absolute necessity of protecting the delivery of Kansas' portion of the water supply in conformity with crop requirements compels a more detailed examination of the facts. For this reason defendants have requested an additional finding of fact as follows:

> "Colorado, being the upper state, has the first opportunity to divert and use the waters of the Arkansas River for irrigation purposes, and has so

diverted and used said waters to the extent that users in Kansas have been deprived of practically all of the dependable flow of the stream. Such water as at present passes across the state line into Kansas consists of flash floods of a day or a few days duration, most of which is not subject to diversion or use. Water which can be captured from such floods is intermittent and bears little or no relation to crop requirements."

The development of irrigation in Colorado extended over a period of 50 or 60 years. The impact of each succeeding year's development, whether small or great, placed an additional burden on the water supply and depleted the supply to the extent of such burden. The allocation of this burden to any particular period of time, and whether temporary or permanent, is a complex problem. This is due to the fact that, first, the type of burden placed upon stream flow has a different resulting effect on depletion; and second, the difference in the total quantity of the water supply each year requires comparison of years when the water supply was similar in quantity in order to obtain an accurate determination of the extent of the depletion.

The simplest, and perhaps the most accurate, method of determining the extent of permanent depletion is by the ascertainment at any given period of time of the acreage

under irrigation which constitutes a permanent burden upon stream flow.

1. Temporary and Permanent Depletion

When land is first put under irrigation more water is applied to the land than is permanently consumed. This is largely due to the fact that in new areas a building up of the water table takes place. As the water table is built up, there is created a return flow back to the stream over a period of months or a few years, depending upon the distance of the irrigated lands from the stream, the character of the soil, and the topography. However, this, while lost to the stream in the form of diversions, is not a permanent loss, as it ultimately gets back to the stream in the form of return flow. This might be likened to a case of priming the pump. The excess water which is not destroyed is in reality borrowed from the stream in the early stages of irrigation, and finds its way back for other uses after the period of stabilization has been reached. Of course this amount which is borrowed and not permanently destroyed might fluctuate somewhat between dry cycles and wet cycles, but from the beginning the actual amount of water which is permanently lost to the stream has a fairly constant consumptive use value

per acre (R. 5201). Witness Knapp said, "It is my opinion that the permanent depletion of the average water supply depends upon the actual number of acres irrigated and the date when they were placed under irrigation."

Every acre of land which is put under irrigation has a very definite ultimate consumptive use of water. The water is consumed in plant growth, and is evaporated in connection with the growing of crops. This water is thus totally destroyed or consumed, and to that extent is a complete depletion of the water so used. From the particular time that a given acre is put under irrigation it becomes as of that time a permanent additional burden upon the water supply of the stream. Before that acre was put under irrigation that amount of water was not consumed in plant growth or destroyed by evaporation incident to cultivation (R. 5199-5200).

2. Irrigated Acreage as Measure of Permanent Depletion

The actual irrigated acreage forms the only means by which the extent of permanent depletion can be measured. Although the irrigating ditches in the great irrigated area in Colorado, east of Pueblo, were first started during the 1870's, only 33,390 acres were under irrigation in 1889. This had increased to 143,952 acres in 1899, 212,341 acres

in 1902 and to 389,435 acres in 1929. Thus the Kansas ditches which had been constructed and were in operation 1889, at a time the Colorado ditches in the plains area were irrigating only approximately 33,390 acres, have been faced with the permanent depletion of the water supply of the Arkansas River to the extent of the burden of 356,045 additional acres of additional land under irrigation in Colorado since the time the Kansas ditches first applied water to beneficial use.

If one takes the basis of the irrigation census of 1902, the total acreage under irrigation increased from 300,115 in 1902 to 558,072 in 1929 (Kansas Exh. 52, page 1507). In this period the State of Kansas has faced a permanent depletion of water supply since that date, by reason of the burden of 257,957 acres of land placed under irrigation in Colorado; or if we take the extent of the depletion in the five great irrigating counties in Districts 14, 17 and 67 where the irrigated acreage increased between 1902 and 1929 from 212,341 acres to 389,435 acres, the extent of the permanent depletion of the water supply is measured by the 177,094 acres of additional burden imposed upon the stream flow in that period and by that area.

To visualize this increased acreage in terms of the ex-

tent of actual water depletion it is only necessary to apply thereto a measure of the stabilized consumptive use of water per acre. Witness Tipton for Colorado stated that he did not believe consumptive use under stabilized conditions would be above 1.90 acre-feet per acre (R. 4372). He likewise arrived at an average consumptive use figure for the five-year period 1926 to 1930 of 1.96 acre-feet per acre. This period, being at least a decade after any substantial ditch or reservoir development had taken place, might also well reflect the measure of permanent stabilized consumptive use in Colorado. By taking the value 1.9 as the measure of permanent stabilized consumption, and applying it to the acreage under irrigation at any one given time, it is possible to determine with reasonable accuracy the extent of the permanent depletion of the water supply at such time. Thus, on the basis of 33,390 acres irrigated in 1889 in the basin between Pueblo and the Kansas-Colorado line, the extent of the burden of water depletion in that area and at that time would amount to 33,390 acres times 1.9, or 63,440 acre-feet. The effect of this on an average dependable water supply of 1,110,000 acre-feet would hardly represent an effective obstacle to irrigation development in Kansas.

If we take the same area, that is, from Pueblo to the Kansas-Colorado line, as of the period of 1902, we find the total irrigated acreage of 212,341 acres. By applying the same formula the extent of permanent depletion of water supply due to irrigation in that area amounted to approximately 403,420 acre-feet. This represented a rather substantial amount and by that date was making effect felt on the Kansas ditches. However, by 1929 the permanent water depletion resulting from the irrigation of 389,435 acres in this same area, Pueblo to the state line, had brought about a depletion amounting to 739,926 acre-feet, or an added burden between 1902 and 1929 in that area alone amounting to 336,506 acre-feet. We have used this particular section since the great increase in irrigated acreage occurred in that particular region, and since irrigation in that area and irrigation in Western Kansas started at substantially the same time. However, if we take the irrigated acreage in the entire Arkansas River basin as of 1902, when 300,115 acres were listed as being under irrigation, the permanent burden upon the water supply at that time amounted to approximately 570,218 acre-feet.

By 1929 the total irrigated acreage amounting to 557,-148 acres had imposed a permanent depletion on stream

flow amounting to 1,058,581. The foregoing figures with respect to acreage were obtained from (Kansas Exhibit 52, R. p. 1507).

3. Reservoir Development as an Additional Factor

It must be remembered that the permanent depletion by this acreage does not take into consideration any depletion by reason of loss in water storage. As before stated, the storage of water in reservoirs in the Arkansas basin in Colorado started approximately in 1896. By 1902 five reservoirs had been constructed with a total decreed capacity of 217,925 acre-feet. Subsequent to that time, and continuing down until approximately the year 1920, 28 additional reservoirs were constructed in Colorado with a total decreed capacity of 321,226 acre-feet, or a total storage capacity of 539,151 acre-feet. At the present time, however, the total storage capacity, omitting the new Caddoa Reservoir, amounts to 521,506 acre-feet due to the washing out of two of the reservoirs (Kansas Exhs. 65 and 67; pages 1543 and 1556).

The reservoir development in Colorado and the storage of large quantities of water therein adds an additional factor of permanent depletion. Mountain and plains run-off is stored in large quantities and used in late summer

irrigation, or carried off in years of heavy runoff and used in years of low runoff. The water impounded in these reservoirs is largely lost to stream flow outside the State of Colorado (R. 1525). The effect of these reservoirs on the permanent depletion of water supply comes about to a considerable extent through evaporation of water during the period in which it is held in storage for future use. Evaporation losses of water stored in reservoirs in the plains area are heavy in the summer months, and are a total loss to irrigators in Colorado and Kansas (R. 1525). In the plains area in Colorado the rate of evaporation during the summer season amounts to 2.75 feet in depth, while the annual rate is 3.62 feet in depth (Colorado Exh. 219, page 6689), so that in this particular section stored water sustains a loss by evaporation of 3.62 acre-feet per acre of water surface in the reservoirs annually.

Inasmuch as the amount of water in storage on November 1 in the Arkansas River basin in Colorado, after summer uses were satisfied, averages 112,000 acre-feet for the 18 years of which records were available (R. 1555), it is evident that depletion by evaporation becomes an item of considerable importance.

These two factors of increased irrigated acreage and

increased water storage have resulted in increased water consumption in Colorado. The Record shows from the testimony of Witness Meeker (R. 1565) that the increased consumption in the entire river basin in Colorado is as follows:

1870 estimated at	45,000 acre-feet
1880 estimated at	100,000 acre-feet
1890 computed at	280,000 acre-feet
1898 to 1902	630,000 acre-feet
1903 to 1907	760,000 acre-feet
1908 to 1912	920,000 acre-feet
1913 to 1917	1,100,000 acre-feet
1918 to 1922	1,070,000 acre-feet
1923 to 1927	1,020,000 acre-feet
1928 to 1930	1,060,000 acre-feet

Because water supply fluctuates from season to season, and changes from wet period to dry period, an analysis through comparison of years of similar water production is the only practicable method of ascertaining a true picture of the progressive diminution of state line outflow. Years of similar water supply in an early period and later period can be compared. It is almost impossible to grasp the relationship of the various years and their bearing upon the water supply problem until they are portrayed graphically for the purposes of comparison (R. 1569).

4. Progressive Character of Depletion

We here attach Kansas Exhibit 70. By arranging years of similar water supply in the manner shown in this exhibit one is enabled to draw the actual comparisons and study the problem as a whole without becoming involved in making comparison of figures themselves (R. 1569). In Graph B shown on Exhibit 70 the years of water supply are arranged according to the magnitude of flow. This arrangement is made in order that the low water years in the 1890-1900 decade can be compared with the low water years in the 1920-1930 decade, or other decades, in order that high water years in various periods may be compared with high water years of other periods (R. 1574). The bar represents the total water supply of the year, which is segregated into three items where data is available. The red and green areas represent water consumption in Colorado; the stippled areas represent state line outflow from the Colorado area, or the unconsumed water; and the black portion represents the divertible water during the irrigation season of April to October for Kansas ditches, which is embraced in the outflow at the state line (R. 1575). The line marked "50% river depletion" is drawn through points half way down the various bars, and represents 50 percent of the water supply or river de-

AMOUNTS IN ACRE-FEET

ARKANSAS RIVER WATER SUPPLY IN COLORADO 1895 TO 1930

RECONSTRUCTED RIVER WITH OUTFLOW AT COLORADO — KANSAS LINE

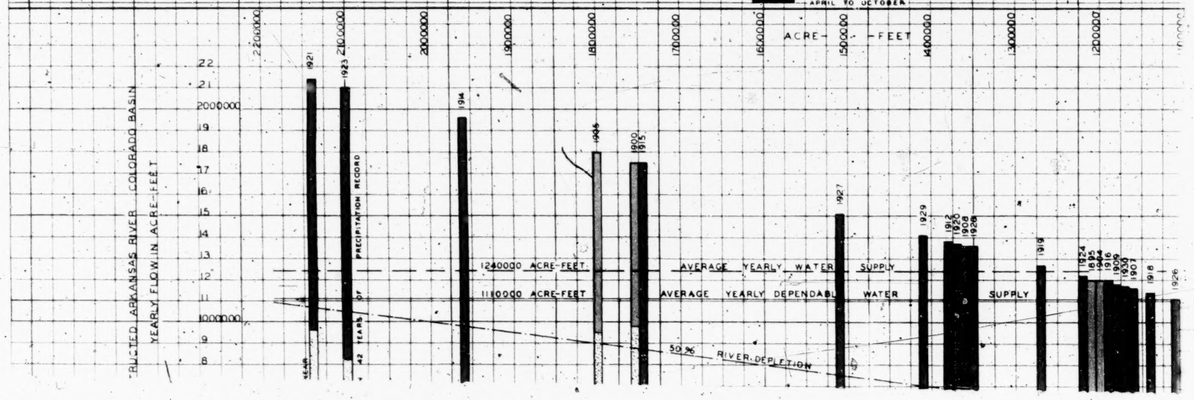
PREPARED FROM RECORDS OF RIVER FLOW OF U.S. GEOLOGICAL SURVEY + STATE OF COLORADO AND STATE OF KANSAS

BY MEEKER - IRRIGATION ENGINEER - DENVER COLORADO

ARKANSAS RIVER WATER SUPPLY COLORADO

HOLLY OUTFLOW SUPERIMPOSED ON WATER SUPPLY

LEGEND — COLORADO WATER SUPPLY
RIVER OUTFLOW AT HOLLY
WATER DIVERTIBLE - KANSAS CANALS APRIL TO OCTOBER

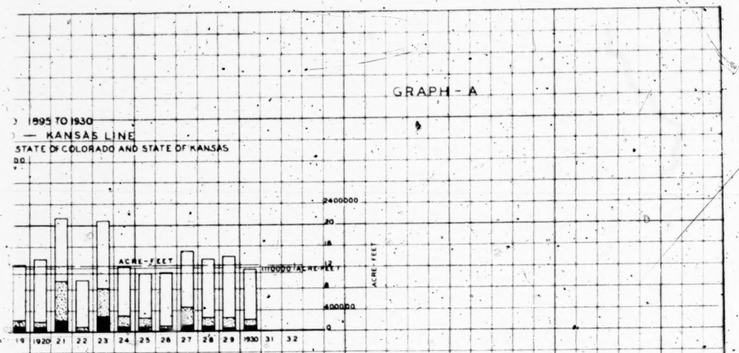


GRAPH - A

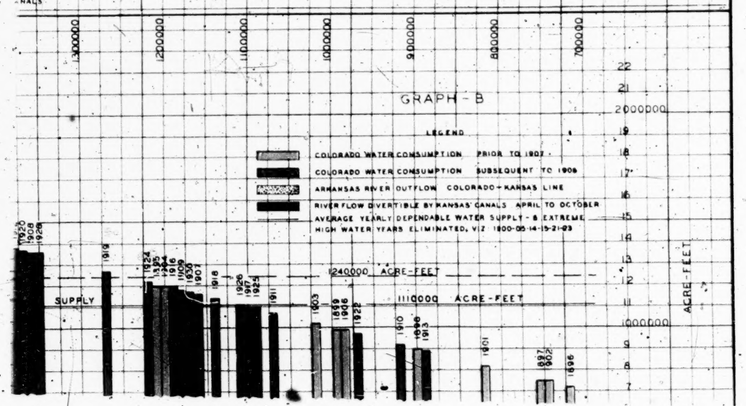
1895 TO 1930

— KANSAS LINE

STATE OF COLORADO AND STATE OF KANSAS



GRAPH - B



ARKANSAS RIVER BASIN IN COLORADO

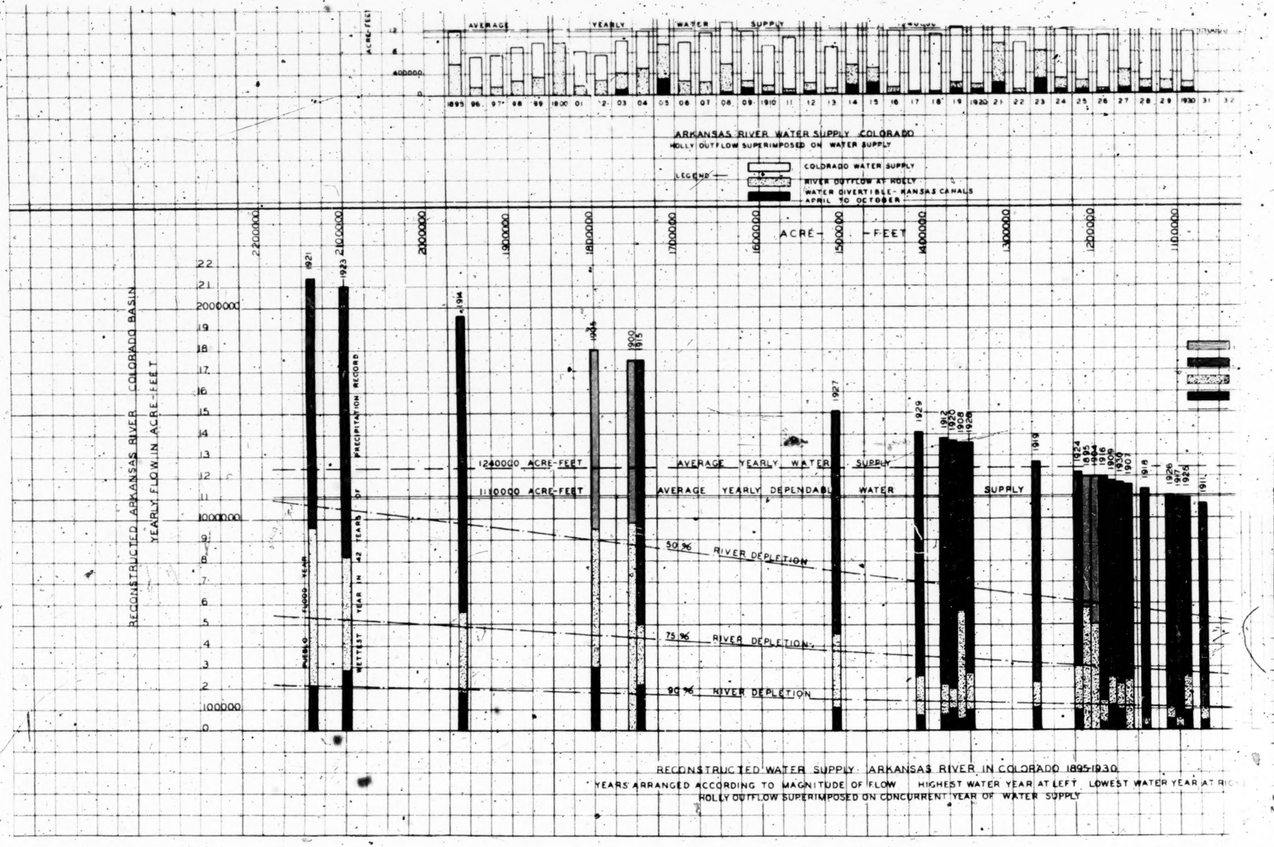
YEARLY WATER SUPPLY IN ACRE-FEET

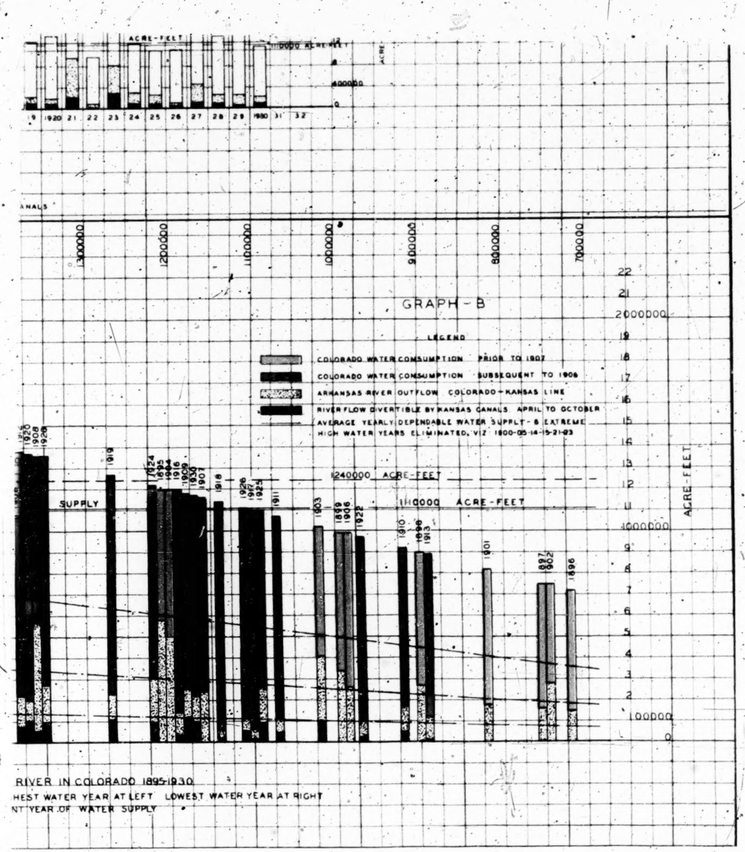
YEAR	COLORADO WATER SUPPLY	COLORADO WATER CONSUMPTION TOTAL	% OF YEARLY WATER SUPPLY	% OF AVERAGE YEARLY WATER SUPPLY 1240000	HOLLY OUTFLOW TOTAL	% OF YEARLY WATER SUPPLY	% OF AVERAGE YEARLY WATER SUPPLY 1240000
1895	1200000	620000	52	50	580000	48	47
96	720	570	79	46	150	21	12
97	750	590	79	48	160	21	13
98	900	630	70	51	270	30	22
99	990	650+	66	52	340	34	27
1900	1250000	770000	44	62	980000	56	79
01	820	640	78	52	180	22	15
02	750	470	63	38	280	37	23
03	1020	610	60	49	410	40	33
04	1200	700	58	56	500	42	40
1905	1800000	850000	47	68	950000	53	77
06	990	730	74	59	260	26	21
07	1160	920	79	74	240	21	19
08	1360	790	58	64	570	42	46
09	1180	930	79	75	250	21	20
1910	920000	750000	82	60	170000	18	14
11	1070	960	90	77	110	10	9
12	1380	1160	84	94	220	16	18
13	990	770	87	62	120	13	10
14	1960	1400	72	113	560	28	45
1915	1750000	1250000	72	101	500000	28	40
16	1200	1060	88	86	140	12	11
17	1100	1040	95	84	60	5	5
18	1140	1080	95	87	60	5	5
19	1270	1040	82	84	230	18	19
1920	1370000	1170000	85	94	200000	15	16
21	*2140	1180	55	95	* 960	45	77
22	970	870	90	70	100	10	8
23	*2100	1280	61	103	** 820	39	66
24	1220	920	75	74	300	25	24
1925	1100000	840000	76	68	260000	24	21
26	1110	1000	90	81	110	10	9
27	1510	1050	70	85	460	30	37
28	1360	1090	80	88	270	20	22
29	1410	1150	82	93	260	18	21
1930	1170000	950000	81	77	220000	19	18
AVERAGE	1240000	* PUEBLO FLOOD			** WETTEST YEAR IN 42 YEARS		

5 YEAR MEANS

1895-99	912000	612000	67	49	300000	33	24
1900-04	1108	638	58	51	470	42	38
1905-09	1298	844	65	68	454	35	37
1910-14	1244	1008	81	81	236	19	19
1915-19	1292	1094	85	88	198	15	16
1920-24	1560	1084	70	87	476	30	38
1925-29	1298	1026	79	83	272	21	22

10 YEAR MEANS





1900	1750000	770000	44	62	980000	56	79
01	820	640	78	52	180	22	15
02	750	470	63	38	280	37	23
03	1020	610	60	49	410	40	33
04	1200	700	58	56	500	42	40
1905	1800000	850000	47	68	950000	53	77
06	990	730	74	59	260	26	21
07	1160	920	79	74	240	21	19
08	1360	790	58	64	570	42	46
09	1180	930	79	75	250	21	20
1910	920000	750000	82	60	170000	18	14
11	1070	960	90	77	110	10	9
12	1380	1160	84	94	220	16	18
13	890	770	87	62	120	13	10
14	1960	1400	72	113	560	28	45
1915	1750000	1250000	72	101	500000	28	40
16	1200	1060	88	86	140	12	11
17	1100	1040	95	84	60	5	5
18	1140	1080	95	87	60	5	5
19	1270	1040	82	84	230	18	19
1920	1370000	1170000	85	94	200000	15	16
21	*2140	1180	55	95	* 960	45	77
22	970	870	90	70	100	10	8
23	**2100	1280	61	103	** 820	39	66
24	1220	920	75	74	300	25	24
1925	1100000	840000	76	68	260000	24	21
26	1110	1000	90	81	110	10	9
27	1510	1050	70	85	460	30	37
28	1360	1090	80	88	270	20	22
29	1410	1150	82	93	260	18	21
1930	1170000	950000	81	77	220000	19	18
AVERAGE	1240000	* PUEBLO FLOOD		** WETTEST YEAR IN 42 YEARS			
5 YEAR MEANS							
1895-99	912000	612000	67	49	300000	33	24
1900-04	1108	638	58	51	470	42	38
1905-09	1298	844	65	68	454	35	37
1910-14	1244	1008	81	81	236	19	19
1915-19	1292	1094	85	88	198	15	16
1920-24	1560	1084	70	87	476	30	38
1925-29	1298	1026	79	83	272	21	22
18 YEAR MEANS							
1895-1912	1109000	742000	67	60	368000	33	30
1913-1930	1376	1063	77	86	313	23	25

COLORADO WATER CONSUMPTION
FROM CURVE OF WATER CONSUMPTION EXHIBIT

PERIOD		ACRE-FEET
1880		100000
1890		280000
1898-1902	5 YR MEAN	630000
1903-1907	5 YR MEAN	760000
1908-1912	5 YR MEAN	920000
1913-1917	5 YR MEAN	1100000
1918-1922	5 YR MEAN	1070000
1923-1927	5 YR MEAN	1020000
1928-1930	3 YR MEAN	1060000

pletion, and shows when water consumption is either 50 percent or more. Likewize, the 75 percent line and the 90 percent line are drawn at points of three-fourths or nine-tenths of the bars, and likewise show when water consumption has attained those percentages. They are put there for ready comparison, so that one can readily see what the relation of the water consumption of the various types of years is to the water supply (R. 1577).

It will be noted that during the earlier period the water consumption of the high water and normal years follow closely the line of 50 percent, while the water consumption of the later high water years and normal years followed roughly the line of 75 percent river depletion, indicating an increase in river depletion of 25 percent of the water supply. Referring to the low water years of both periods, we find the water consumption during the earlier period generally was above the line of 75 percent depletion while during the later period it roughly approximated the line of 90 percent river depletion. Increased lands in Colorado with increased water diversions, and resultant increased water consumption in Colorado, is the reason for this apparent increase in water depletion. Reservoirs largely constructed since 1905 have

been an important factor in increasing water consumption (R. 1578).

All of the factors relating to depletion, the extent, the effect upon state line flow, the utility of such state line flow for irrigation in Kansas, and other allied facts, must for complete understanding be related back to the changing total water supply. Equal quantities of state line flow as between two given years does not mean that there was no change in depletion, since in one year the total quantum of water supply might be much greater than in another. Neither does a similarity in the number of days in two given years when water was not available for crop needs indicate lack of depletion, for again a shortage in the total quantum of water supply in one year would produce an identical situation, as where there was much greater depletion of a much more ample supply. Similar years must be compared and from them the effect of progressive river depletion judged.

The record, however, permits the comparison between years of similar water supply (see Kansas Exh. 62, page 1519, and Kansas Exh. 70, page 1569). Comparable years of water supply were: 1895 with 1,200,000 acre feet; 1904 with 1,200,000 acre-feet; and 1930 with 1,170,000 acre-feet. The respective outflow at Holly: 1895, 580,000

acre-feet, or 48 percent of the total supply; 1904, 500,000 acre-feet, or 42 percent of the total supply; and 1930, 220,000 acre-feet, or 19 percent of the state line flow; indicating a depletion in the state line flow of 360,000 acre-feet since 1895, and of 280,000 acre-feet since 1904 (R. 1585-'86). The year 1899 with 990,000 acre-feet of total water supply and 340,000 acre-feet in the state line outflow, or 34 percent of the water supply, as compared with 1922, with 970,000 acre-feet of water supply and 100,000 acre-feet of outflow, or 10 percent of the total supply, shows a depletion of 240,000 acre-feet in the state line outflow.

The years of 1903 with 1,020,000 acre-feet of supply and 610,000 acre-feet of state line outflow; and 1904 with 1,200,000 acre-feet of water supply and 700,000 acre-feet of state line outflow, can be compared with 1917, with 1,100,000 acre-feet of water supply and 60,000 acre-feet outflow, 1918 with 1,140,000 acre-feet of water supply and 60,000 acre-feet outflow, and 1926 with 1,110,000 water supply and 110,000 acre-feet outflow. In the two earlier years the average water supply was 1,110,000 acre-feet; the average of the three later years was 1,116,000 acre-feet. The average outflow of the two earlier years was 655,000 acre-feet; the average of the three later years was

76,000 acre-feet. The depletion of supply had increased by 579,000 acre-feet. In the earlier years the percentage of outflow to water supply was 59 percent. In the three later years the percentage of state line outflow to water supply was 6.8 percent.

If low water years in the earlier period, namely, 1898, 1899, 1903 and 1906, where the average water supply was 975,000, are compared with low water years in the later period, namely 1910, 1913, 1922, 1926, where the average water supply was 972,500 acre-feet, the ratio of state line outflow to water supply in the earlier years was 33 percent, that of the later years 13 percent.

If we take the three water years following the census of 1902 and down to conclusion of evidence in the Kansas-Colorado case, namely the years 1903, 1904 and 1905, and compare them with the last three years of which there is any water supply study, namely 1928, 1929 and 1930, the record shows the following: That the average water supply of the three years 1903 to 1905, inclusive, was 1,340,000 acre-feet, the average state line outflow 620,000 acre-feet. The average percentage of state line outflow to total average water supply was 46.2 percent. That the average water supply of the three years 1928 to 1930, inclusive, was 1,313,000 acre-feet. The average state line

outflow was 250,000 acre-feet, and the percentage of state line outflow to average total water supply was 19 percent.

Since the close of testimony in the original Kansas-Colorado suit the consumption of water in Colorado has increased to the extent of 300,000 acre-feet of the average yearly dependable water supply (R. 1742). The Colorado average consumption during the eleven years 1920 to 1930 was 1,045,000 acre-feet, approximately 95 percent of the dependable supply (R. 1521).

The foregoing story of water depletion amply justifies the statement of State Engineer Hinderlider of Colorado, "*practically all of the water escaping out of this valley into Kansas is the result of tributary flow entering the river in the lower reaches of the valley.*" (R. 1739.)

5. Character of Residual Flow into Kansas

Depletion of quantity is only a portion of the picture. Depletion in character or usability of what is left is the other. When the state engineer of Colorado spoke of water escaping into Kansas, he was speaking of vagrant water which could not be captured or used in Colorado. The character of flow, the continuity of flow, the distribution of flow with respect to its utility for agricultural purposes, all are related to and become integral parts of

the equitable right of the lower state to participate in the realization of benefits from such flow.

Defendants here propose to discuss depletion in terms of effect on the usability of state line flow. Depletion measured in terms of total water supply may reflect a 90 percent loss to the total supply, but if it is measured in terms of its effect on the character and kind of flow, it may reflect an almost total destruction of any practical benefits which can arise from the use of such flow.

The Supreme Court of the United States in announcing the doctrine of equitable apportionment clearly indicated that those benefits which each state has a right to enjoy on the basis of equity are those resulting from or which can be realized from the flow of the stream. What is controlling is that the continuity of stream flow be so maintained from the standpoint of utility, that from that flow Kansas may be able to realize therefrom such irrigation development and returns, as equity and justice give her a right to expect. The right of the State of Kansas to an equitable apportionment of the benefits resulting from the flow of the river is certainly not satisfied merely because a certain gross quantum of water escapes across the line into Kansas on the average each year unless the amount and character of the water which flows into Kansas is,

in such quantum and at such times, a fair percentage of the dependable and usable flow of the river as permits the enjoyment of benefits on an equitable basis with Colorado.

This is but another way of stating a principle already recognized by the courts. In *Kansas v. Colorado,* 206 U. S. 46, *supra,* the court said, "We must consider the effect of what has been done upon the conditions in the respective states and so adjust the dispute upon the basis of equality of rights as to secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of *the like beneficial effects of a flowing stream.*" (Italics ours.)

Since, therefore, Kansas is entitled to enjoy like beneficial effects from the Arkansas River as Colorado, then certainly equitable apportionment of benefits from stream flow must be measured and equities determined by the character of flow utilizable for agricultural purposes, during the time when it is possible to utilize water for that purpose or beneficial use.

Comparisons are the only means available of balancing the equity of benefits derived from the flow of the River. While the diversions in and of themselves are not a measure of permanent depletion, balancing the facts with re-

spect to withdrawals of water in Colorado against the lack of opportunity for withdrawal in Kansas demands consideration.

a. Monthly Diversions in Colorado Compared with Divertible Water Passing Across the State Line

Page 1 of Colorado Exhibit 194 shows the average monthly diversions 1908 to 1938 of only those Colorado ditches which were recorded as taking water from the main river from Parkdale to the Kansas-Colorado line. It is to be noted that these diversions include only part of the diversions for irrigation in Districts 12, 14, 17 and 67, and do not include any diversions in Districts 10, 11, 13, 15, 16, 18 and 19, where the acreage diverting water for irrigation uses amounted in 1929 to 195,800 acres (see Kansas Exh. 57, page 1513; Kansas Exh. 24, page 1462), so that the recorded diversions here referred to represent only a part of the water diverted for irrigation use, and do not reflect any diversions for the 195,800 acres irrigated in these other portions of the basin. However, taking the April to October, inclusive, average of these recorded diversions which represent diversions for only a portion of the irrigated acreage in the basin, we find each monthly average to be as follows:

Month	*Acre-feet*
April	76,688
May	124,768
June	181,262
July	158,631
August	133,126
September	87,449
October	72,781

(Colorado Exh. 194, R. page 6562.)

We can compare these partial Colorado diversions, which do not include the diversions for the 195,800 acres irrigated along the tributaries, with the divertible water passing across the state line by months for the 31-year period 1908 to 1938, as reflected in Colorado Exhibit 211 (R. page 6647). By "divertible" we mean that water flowing in the stream which is susceptible to capture by the headgates of the combined irrigation ditches. This 31-year period April to October, inclusive, represents a total of 217 months. The Kansas opportunity for diversion is as follows: In 102 out of the 217 months the monthly divertible amount of water passing across the state line which could be put to irrigation uses was less than 5,000 acre-feet per month, and only 83 months when the divertible amount measured at the state line was 10,000 acre-feet.

In this same 31-year period there were four years out

of 31 when each of seven months, April to October, inclusive, fell below 10,000 acre-feet; and there were:

5 years when 6 of the 7 months were below a total of 10,000 acre-feet;
4 years when 5 of the 7 months were below a total of 10,000 acre-feet;
7 years when 4 of the 7 months were below a total of 10,000 acre-feet;
6 years when 3 of the 7 months were below a total of 10,000 acre-feet;
3 years when 2 of the 7 months were below a total of 10,000 acre-feet;
2 years when 1 of the 7 months was below a total of 10,000 acre-feet;
No years when all of the 7 months were above 10,000 acre-feet.

The foregoing breakdown by months shows the manner in which the Colorado water diversions so effectively deplete the water passing into Kansas, that little substantial benefit could be realized in the lower state through irrigation.

The first four months of the growing season are critical from the standpoint of irrigating crops. If crops do not have water enough to germinate and get started, the amount which is available from July on is of little use regardless of its quantity.

Colorado Exhibit 211 discloses that in seven years of 31 all of these first four months, April, May, June and July, had less than 10,000 acre-feet of divertible water passing the state line. There were 17 years of the 31-year period when three of the first four months had less than 10,000 acre-feet of divertible water passing the state line, with 13 of these years, when the three months

1917
MONTHLY PRECIPITATION
ARKANSAS VALLEY, COLORADO
PLAINS AREA, AVERAGE 11 STATIONS
O—O LONG TIME AVERAGE
X—X 1917 DEFICIENCY
EXCESS

INCHES

ACRE-FT. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. YEAR % ACRE-FT.

SECOND-FEET

WATER SUPPLY DISTRIBUTION
CANON CITY TO HOLLY COLORADO
ARKANSAS RIVER AT CANON CITY
REPORTED TRIBUTARY INFLOW
UNMEASURED WATER SUPPLY
ARKANSAS RIVER AT HOLLY
DITCH DIVERSIONS CANON CITY TO HOLLY

TOTAL WATER SUPPLY CANON CITY TO HOLLY
TOTAL DITCH DIVERSIONS CANON CITY TO HOLLY
ARKANSAS RIVER CANON CITY
ARKANSAS RIVER HOLLY

JAN. FEB. MAR. APR. MAY JUNE

KANS EX. 78

1917

HYDROGRAPH

Showing Conditions Affecting

ARKANSAS RIVER WATER SUPPLY CANON CITY TO HOLLY, COLORADO, NEAR KANSAS LINE.

Compiled from Official Records of the State of Colorado and the United States

By

Ralph L. Meeker,
Consulting Engineer for the State of Kansas

GROWING SEASON ARKANSAS VALLEY
WESTERN KANSAS 167 DAYS
EASTERN COLORADO 166 DAYS

LEGEND

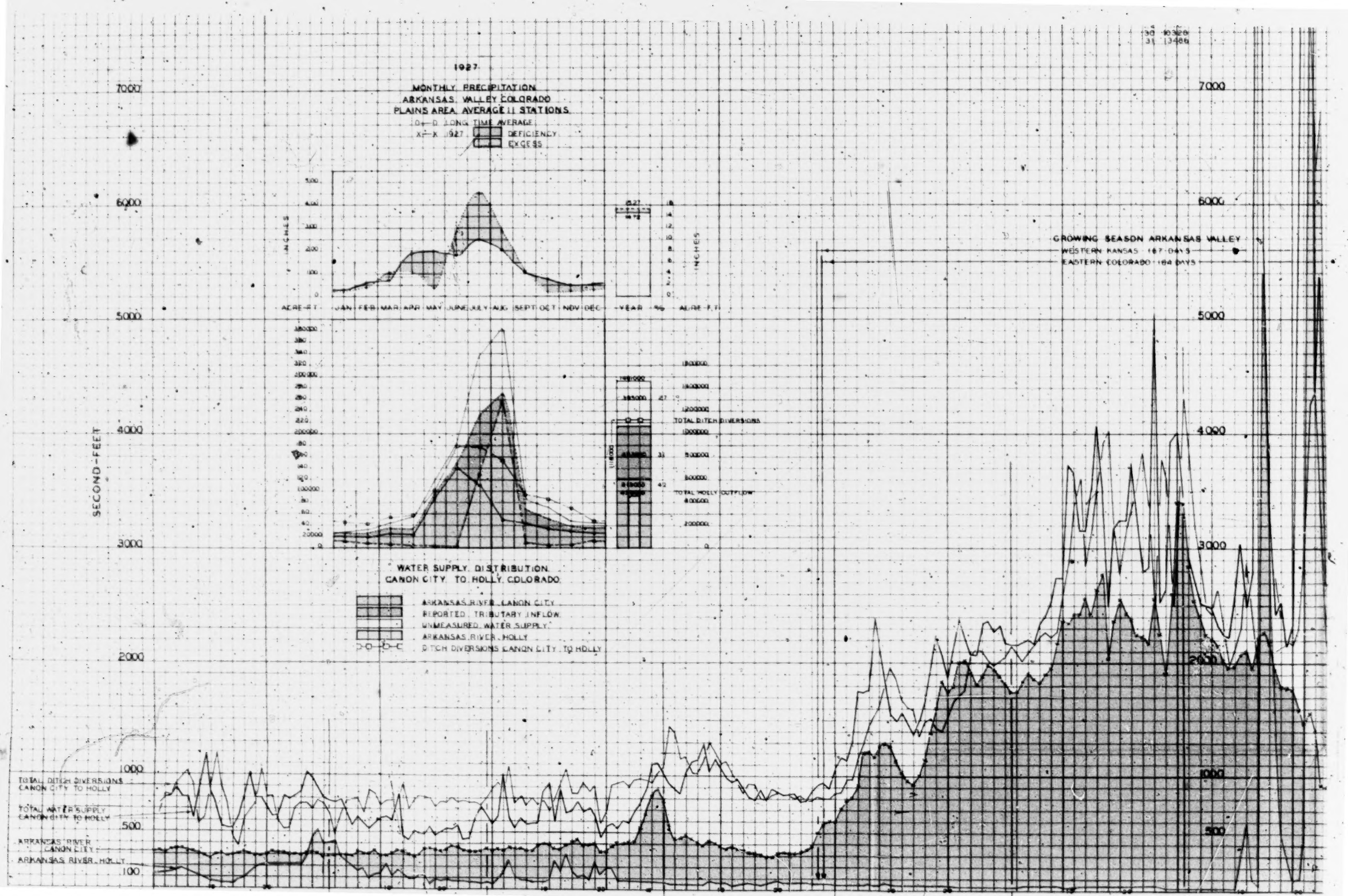
UNMEASURED INFLOW
ARKANSAS RIVER, CANON CITY
ARKANSAS RIVER, HOLLY
TOTAL DITCH DIVERSIONS
TOTAL WATER SUPPLY, CANON CITY TO HOLLY
ARKANSAS RIVER, CANON CITY
ARKANSAS RIVER, HOLLY

ARKANSAS RIVER TOTAL WATER SUPPLY CANON CITY TO HOLLY

7000
6000
5000
1000
500
100

TOTAL DITCH DIVERSIONS CANON CITY TO HOLLY
TOTAL WATER SUPPLY CANON CITY TO HOLLY
ARKANSAS RIVER, CANON CITY
ARKANSAS RIVER, HOLLY

JUNE | JULY | AUG | SEPT | OCT | NOV | DEC


1927
MONTHLY PRECIPITATION
ARKANSAS VALLEY COLORADO
PLAINS AREA AVERAGE 11 STATIONS
O—O LONG TIME AVERAGE
X—X 1927
DEFICIENCY
EXCESS
INCHES
ACRE-FT
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
YEAR
ACRE-FT
WATER SUPPLY, DISTRIBUTION
CANON CITY TO HOLLY, COLORADO
ARKANSAS RIVER, CANON CITY
REPORTED TRIBUTARY INFLOW
UNMEASURED WATER SUPPLY
ARKANSAS RIVER, HOLLY
DITCH DIVERSIONS CANON CITY TO HOLLY
TOTAL DITCH DIVERSIONS
TOTAL HOLLY OUTFLOW
GROWING SEASON ARKANSAS VALLEY
WESTERN KANSAS 187 DAYS
EASTERN COLORADO 184 DAYS
SECOND-FEET
TOTAL DITCH DIVERSIONS CANON CITY TO HOLLY
TOTAL WATER SUPPLY CANON CITY TO HOLLY
ARKANSAS RIVER CANON CITY
ARKANSAS RIVER HOLLY
7000
6000
5000
4000
3000
2000
1000
500
100

KANS. EX. 86

1927

HYDROGRAPH

Showing Conditions Affecting

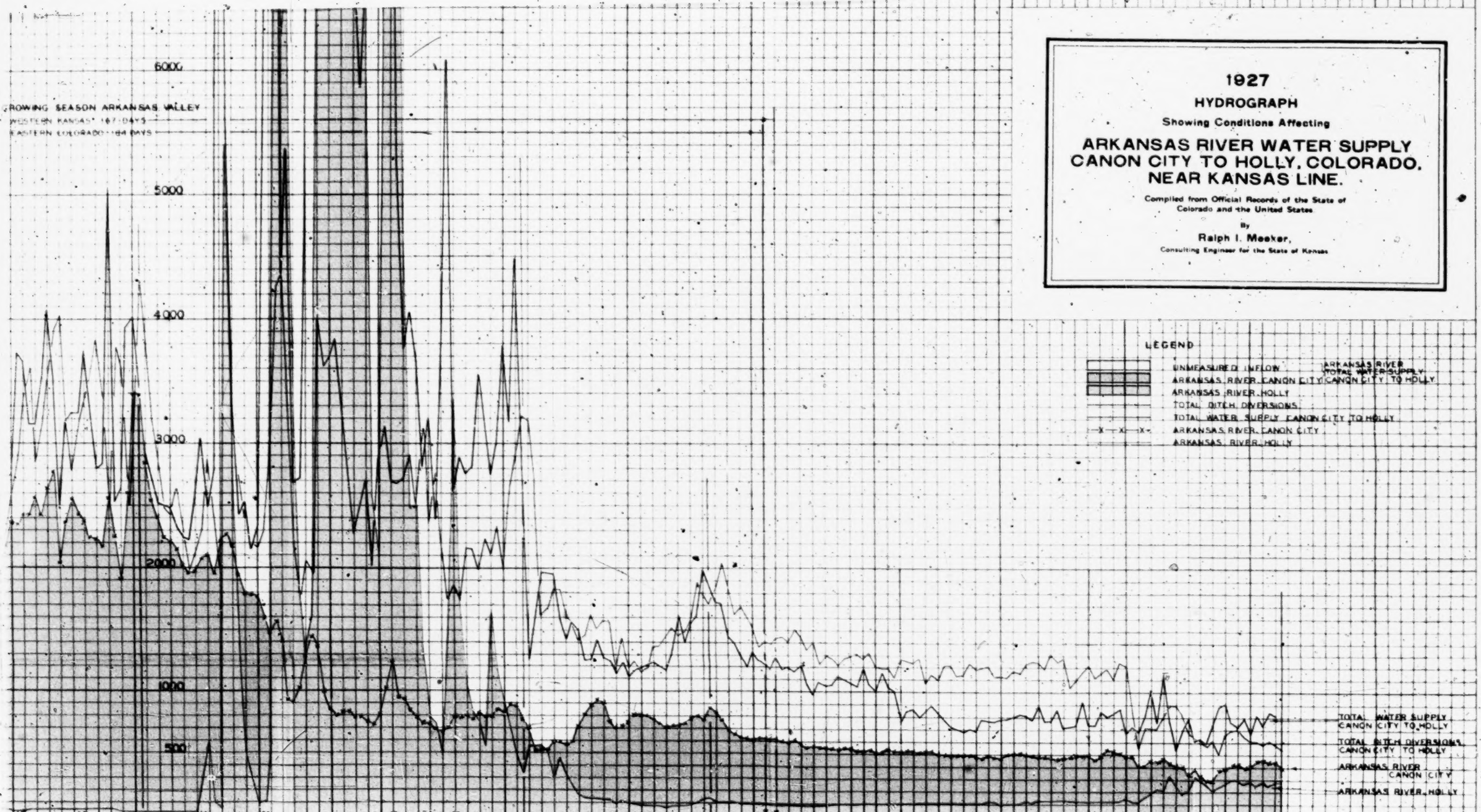
ARKANSAS RIVER WATER SUPPLY CANON CITY TO HOLLY, COLORADO. NEAR KANSAS LINE.

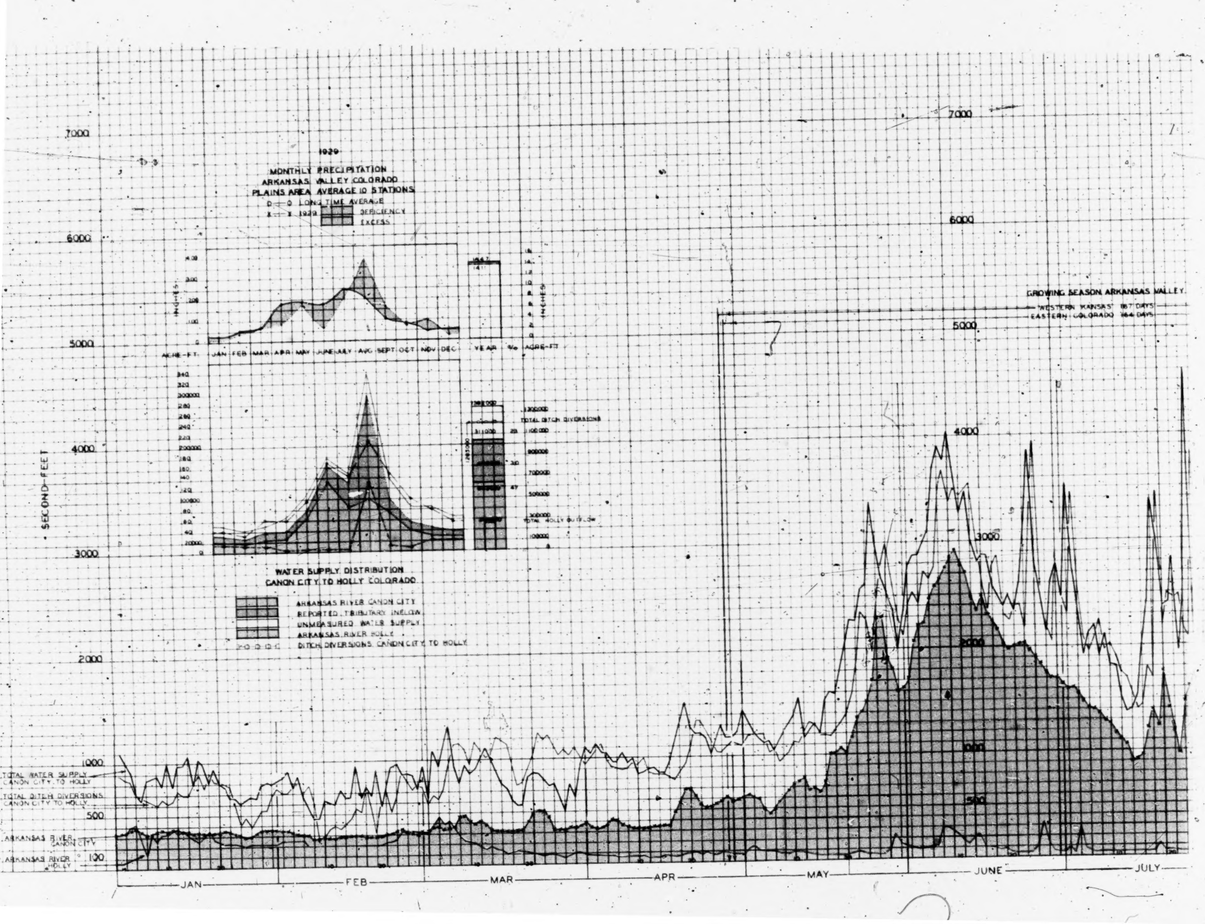
Compiled from Official Records of the State of Colorado and the United States

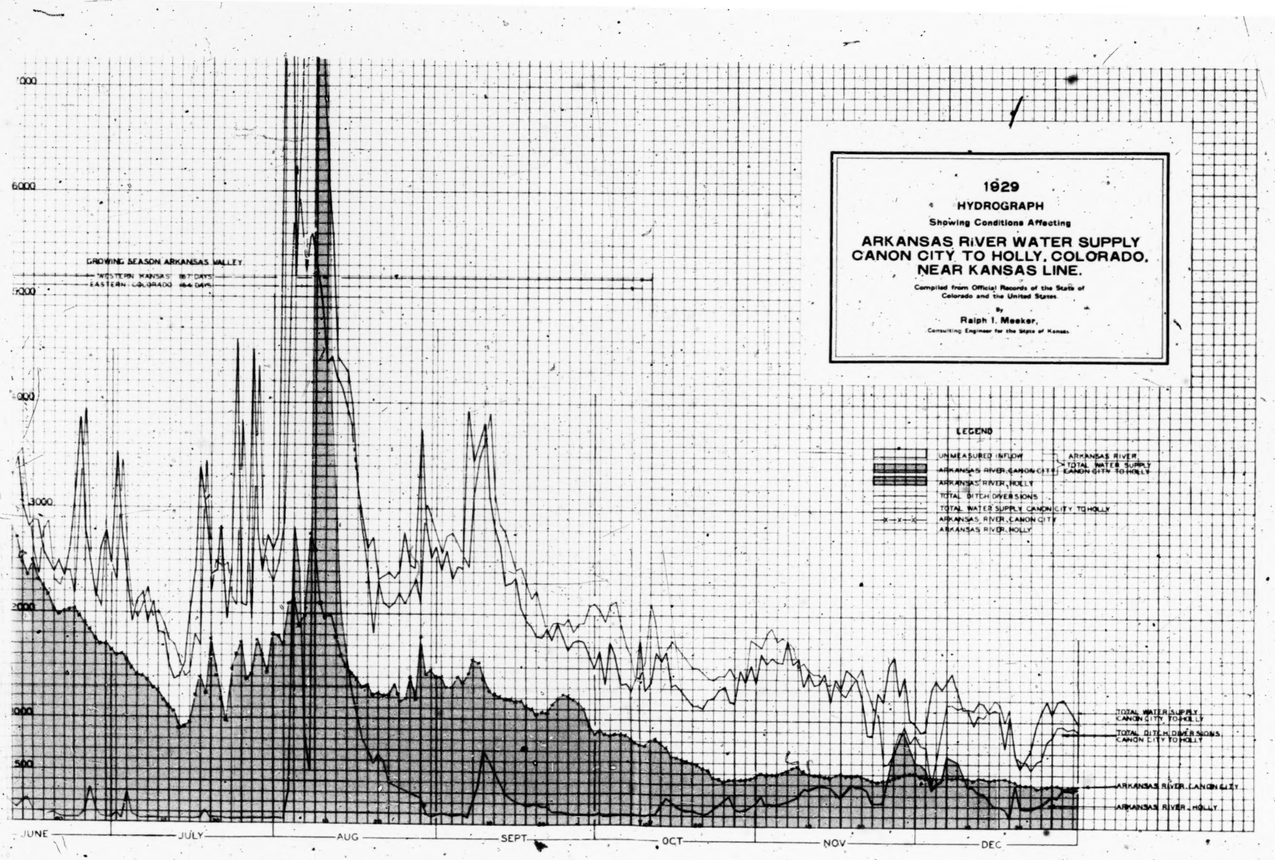
By

Ralph I. Meeker,

Consulting Engineer for the State of Kansas




1929
MONTHLY PRECIPITATION
ARKANSAS VALLEY COLORADO
PLAINS AREA AVERAGE 10 STATIONS
D---D LONG TIME AVERAGE
X---X 1929
DEFICIENCY
EXCESS
WATER SUPPLY DISTRIBUTION
CANON CITY TO HOLLY COLORADO
ARKANSAS RIVER CANON CITY
REPORTED TRIBUTARY INFLOW
UNMEASURED WATER SUPPLY
ARKANSAS RIVER HOLLY
DITCH DIVERSIONS CANON CITY TO HOLLY
GROWING SEASON ARKANSAS VALLEY
WESTERN KANSAS 187 DAYS
EASTERN COLORADO 184 DAYS
SECOND-FEET
TOTAL WATER SUPPLY CANON CITY TO HOLLY
TOTAL DITCH DIVERSIONS CANON CITY TO HOLLY
ARKANSAS RIVER CANON CITY
ARKANSAS RIVER HOLLY
JAN
FEB
MAR
APR
MAY
JUNE
JULY


1929
HYDROGRAPH
Showing Conditions Affecting
ARKANSAS RIVER WATER SUPPLY
CANON CITY TO HOLLY, COLORADO,
NEAR KANSAS LINE.
Compiled from Official Records of the State of Colorado and the United States
By
Ralph I. Meeker,
Consulting Engineer for the State of Kansas.
GROWING SEASON ARKANSAS VALLEY
WESTERN KANSAS 187 DAYS
EASTERN COLORADO 184 DAYS
LEGEND
UNMEASURED INFLOW
ARKANSAS RIVER TOTAL WATER SUPPLY CANON CITY TO HOLLY
ARKANSAS RIVER CANON CITY TO HOLLY
ARKANSAS RIVER HOLLY
TOTAL DITCH DIVERSIONS
TOTAL WATER SUPPLY CANON CITY TO HOLLY
ARKANSAS RIVER CANON CITY
ARKANSAS RIVER HOLLY
TOTAL WATER SUPPLY CANON CITY TO HOLLY
TOTAL DITCH DIVERSIONS CANON CITY TO HOLLY
ARKANSAS RIVER CANON CITY
ARKANSAS RIVER HOLLY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC

76, 86 and 88. These three years were selected because they portrayed graphically the character of the water supply in terms of flow of three different types of water supply years.

Kansas Exhibit 76, portraying the year 1917, represents a year where the basin water supply amounted to 1,100,000 acre-feet, or an amount substantially that found by the Special Master as the average annual dependable supply. Here consumption was so complete in Colorado that state line outflow amounted to only 59,400 acre-feet (Colorado Exh. 209, page 6640).

Kansas Exhibit 86, for the year 1927, represents a year when the water supply amounted to 1,510,000 acre-feet, the highest water supply year on record not eliminated in determining the average annual dependable supply. In this year the state line outflow amounted to 452,900 acre-feet (Colorado Exh. 209).

Kansas Exhibit 88, for the year 1929, represents a year when the water supply of the basin amounted to 1,410,000 acre-feet, a year of plentiful supply and yet a year when the water supply passing across the state line amounted to 250,800 acre-feet or an amount slightly less than the 30-year average (Colorado Exh. 209).

While the explanation of these three hydrographs ap-

pears on their face, it might be well to point out that in the upper left hand corner of each is a small graph portraying the occurrence of precipitation in the plains area of Colorado, showing differences above and below normal. Immediately below this appears a graph showing the monthly water supply distribution in terms of acre-feet. The main graph portrays the flow of the River from Canon City to Holly in terms of second-feet of daily flow. The black jagged line represents the Colorado ditch diversions as recorded from Canon City to Holly. The pink or red portion represents the flow of the stream as recorded at the Canon City gaging station where the Arkansas River emerges from the Royal Gorge. The yellow portion represents the contribution to the River flow in this stretch resulting from plains run-off. The blue portion represents the recorded state line outflow.

Examining the hydrograph for the year 1917 it will be observed that, although Colorado ditch diversions in this stretch of the stream alone, starting with 1,000 second-feet at the beginning of May and during July and August amounting to between 2,000 second-feet and 5,000 second-feet, the water supply opportunity in Kansas was practically worthless for irrigation purposes during the

entire growing season except for a slight spurt in the middle of August, and that the major portion of the 52,000 acre-feet passing across the state line came during the months of January and February.

Examining the hydrograph for the year 1927, during which year the total amount of water passing across the state line amounted to 452,900 acre-feet, an amount which on its face would indicate an ample water supply available for Kansas irrigators, we find that the entire amount was practically worthless for crop requirements. From the beginning of the growing season until the 10th day of July a mere trickle was available, generally approximating only 50 second-feet of flow.

By the 10th of July irrigated crops would have passed beyond redemption, and by the latter part of July and August the River flow, which constitu d practically all of the annual supply, would have been useless. 384,400 acre-feet passed across the state line in that limited period of time.

Turning to the hydrograph for the year 1929, an even worse situation is portrayed. During the year, from the beginning of the growing season through the months of May, June and July, a total of only 15,100 acre-feet was available for irrigation purposes (Colorado Exh. 209),

but in August 129,700 acre-feet flowed down the River in the space of a few days, too late for even the amount that could be captured to serve any practical irrigation use.

These hydrographs portray more effectively than words the necessity of a decree such as The Special Master recommends which will be adequate to make available and protect a dependable water supply to Kansas. While the remaining hydrographs differ in detail, except for a few excessive years in the entire period they tell the same story; but in order to place before the court the exact detail of flow the tables which follow represent a complete analysis of the entire period 1912 to 1931, inclusive.

The growing season in Western Kansas from killing frosts to killing frosts averages 167 days. In the 20 years dealt with by the hydrographs there were 3,340 days making up the total of the growing seasons. Of these on only 415 days did river flow go above 1,200 second-feet at the state line. There were during this period 1,905 days when the flow at the state line was less than 100 second-feet. They were:

462 days out of 3,340 above 1,000 second-feet
672 days out of 3,340 above 500 second-feet
818 days out of 3,340 above 300 second-feet
1,114 days out of 3,340 above 150 second-feet
1,445 days out of 3,340 above 100 second-feet
1,905 days out of 3,340 less than 100 second-feet
1,359 days out of 3,340 less than 50 second-feet

There is here submitted a series of five tables compiled from the hydrographs for the months of May to September, inclusive, covering the 20-year period 1912 to 1931, which show for each month of the 20-year period the facts of the record, contrasting the amounts of daily recorded ditch diversions from Canon City to Holly with the daily flow at the Kansas-Colorado state line.

COMPARISON OF RECORDED DIVERSIONS FROM RIVER, CANON CITY TO HOLLY, WITH TOTAL RIVER FLOW INTO KANSAS AT STATE LINE

MAY—20-YEAR PERIOD

(From Kansas Exh. 71 to 90, Inc.)

		Quantities of Water in Second Feet.	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	Total days.
Number of Days in Month when COLORADO'S Recorded Diversion from Canon City to State Line—	WERE	Above 3000 S. F.	2	26	26	16	2			12		1	4	1	12		8½		18				102½
		From 2000-3000 S. F.	6	3	5	12	12	7	2	14	9	18½	7	4	15	4	14½	7	7	8	2½		157½
		From 1000-2000 S. F.	17	24		3	17	23	21	5	22	12½	19	19	4	19	8	21	6	21½	28½		290½
		From 750-1000 S. F.	6	4				1	8				1	7		8		3		1½			39½
Number of Days in Month when Water passing across the State Line in Kansas—	WAS	Above 1000 S. F.			19	11				6				3		1	1½		8		4		53½
		From 500-1000 S. F.			5	11				1			1½		4	2½	1½		2		½		29
		From 200- 500 S. F.			4	4				5	3½	0	7½	1	8	4½	11		13	½	6½	12	80½
		*Below 200 S. F.	31	31	3	5	31	31	31	19	27½	31	22	27	19	23	17	31	8	30½	20	19	457

* Of the 457 days shown below 200 second feet, 313 or 68.5% were below 50 second feet.

were successive. There were 21 years of the 31-year period with two successive months of the four months, April to July, inclusive, below 10,000 acre-feet. Further analysis of this exhibit shows that in 17 of these 31 years the April, May and June divertible river flow averaged 5,440 acre-feet per month; and that in 18 of the 31 years the April, May, June and July average per month was only 7,280 acre-feet.

b. The Utility of State Line Flow for Irrigation

Averages of state line outflow presents only one part of the picture with respect to its effect on the opportunities to carry on irrigation from the water supply of the Arkansas River in the arid region in Western Kansas. The quantity of water passing across the state line, even monthly averages, does not represent its usability for irrigation. The opportunity to benefit from the flow is one of the primary equities.

Average amounts of water passing across the state line, average amounts of water during the growing season, and gross river depletion, do not present a complete understandable picture of the handicaps of irrigation in Kansas, by reason of the depletion of river flows upon the irrigation opportunity from a practical standpoint. Gross quantities of water expressed in terms of acre

feet per growing season, or annually, or monthly, do not show the value of such amounts of water for irrigation purposes (R. 1589). Crops are not grown with annual divertible amounts of water, nor yet with average divertible amounts during the growing season. River flows are not uniform—they vary from day to day, and flood spurts are of frequent occurrence. Ditch capacities are limited, and flood flows are flashy in character, and of a few days duration. A large portion of the water measured in terms of acre-feet may pass the headgate of a given ditch in two or three days time, with but small percent divertible, due to the limited capacity of the ditch. It is necessary to portray daily river performance in second feet, and to compare monthly irrigation requirements in second-feet in specific areas (R. 1590).

One of the primary requirements for irrigation is a continuous and adequate water supply from month to month and day to day during the irrigation season (R. 1591). The river supply passing into Kansas is non-uniform, consisting of flood spurts, from rains on the plains area, and of a duration, intermittent in character (R. 1591).

In dealing with a water supply largely produced

through flood spurts two factors must be especially considered:

First, that although a large quantity of water might be flowing in the river for a period of a few days, the amount that can be captured depends upon the combined headgate capacity of all the ditches.

Second, the usability of water so captured is dependent upon whether or not the ditches were dry before the flood spurt. If dry, there would be considerable losses in getting water to the land, and distribution through laterals would likewise consume considerable water. Losses are much greater when the ditch has been dry and water is run (R. 1606). Canal losses under ordinary conditions are about 20 percent, 25 percent, or 30 percent, depending on the soil. When dry ditches, probably 35 percent or 45 percent might be lost (R. 1606).

The day by day situation of river flow at the Kansas-Colorado line is accurately portrayed by hydrographs (Kansas Exh. 71, page 1618; Kansas Exh. 72, page 1623; Kansas Exh. 73, page 1627; Kansas Exh. 74, page 1630; Kansas Exh. 75, page 1634; Kansas Exh. 76, page 1636; Kansas Exh. 77, page 1638; Kansas Exh. 78, page 1640;

Kansas Exh. 79, page 1643; Kansas Exh. 80, page 1646; Kansas Exh. 81, page 1649; Kansas Exh. 82, page 1650; Kansas Exh. 83, page 1653; Kansas Exh. 84, page 1656; Kansas Exh. 85, page 1659; Kansas Exh. 86, page 1663; Kansas Exh. 87, page 1665; Kansas Exh. 88, page 1671; Kansas Exh. 89, page 1680; and Kansas Exh. 90, page 1684). These hydrographs show the rainfall conditions month by month, and in annual totals, in Colorado; they show the Canon City flow day by day, which flow is the supply most effective for irrigation uses during the early period of the growing season, since it is largely composed of mountain runoff; they portray the total additions to the water supply from the plains runoff, and tributary inflow; they show the daily ditch diversions by the Colorado ditches to the extent that they have been officially recorded, and they show the day by day amount passing across the state line into Kansas. These hydrographs extend from 1912, the date of the beginning of the first fairly complete records ascertainable, down through the year 1931. The exhibits deal with the water supply and diversions from Canon City to the state line.

Defendants are attaching three of these hydrographs for the convenience of the court, which are reproductions, although reduced somewhat in size, of Kansas Exhibits

COMPARISON OF RECORDED DIVERSIONS FROM RIVER, CANON CITY TO HOLLY, WITH TOTAL RIVER FLOW INTO KANSAS AT STATE LINE

JUNE—20-YEAR PERIOD

(From Kansas Exh. 71 to 90, Inc.)

		Quantities of Water in Second Feet	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	Total days.
Number of Days in Month when COLORADO'S Recorded Diversion from Canon City to State Line—	WERE	Above 3000 S. F.	30	6	25	18		19	16	7	28		22	24	25		20	15½	16	10	2		283½
		From 2000-3000 S. F.		18	3	6	23	11	10	19	2		8	6	5	3½	6	14½	14	20	24		193
		From 1000-2000 S. F.		6	2	6	7		4	4		10				26½	4				4		73½
		From 750-1000 S. F.										10											10
Number of Days in Month when Water passing across the State Line in Kansas—	WAS	Above 1000 S. F.	6	1	21	18	½					26		12	8½	1½	2		16				114½
		From 500-1000 S. F.	6	1	5	4								5	6½	3	13		8				51½
		From 200- 500 S. F.	3	3	4	3	3½		5		2			4	5	1½	7		2	4	3	3	53
		*Below 200 S. F.	15	25		5	26	30	25	30	28	4	30	9	10	24	8	30	2	26	27	25	379

*Of the 379 days shown below 200 second feet, 236 or 62.2% were below 50 second feet.

COMPARISON OF RECORDED DIVERSIONS FROM RIVER, CANON CITY TO HOLLY, WITH TOTAL RIVER FLOW INTO KANSAS AT STATE LINE

JULY—20-YEAR PERIOD

(From Kansas Exh. 71 to 90, Inc.)

		Quantities of Water in Second Feet.	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	Total days.
Number of Days in Month when COLORADO'S Recorded Diversion from Canon City to State Line—	WERE	Above 3000 S. F.	3	24	6	9	3	15	7	5	15	2	22	23		12	8	14	7	3			158
		From 2000-3000 S. F.	11	6	25	14	13	14	15	12	10	24	20	8	18	6	11	14	8	17	10		256
		From 1000-2000 S. F.	17	1		8	15	2	9	14	6	7	9		13	13	12	2	16	11	21		176
		From 750-1000 S. F.																					
Number of Days in Month when Water passing across the State Line in Kansas—	WAS	Above 1000 S. F.		2	14	1½					4	30		14		13½		13	2				94
		From 500-1000 S. F.	2		1	7½				1	5	1		3		1½	2	1	½				25½
		From 200- 500 S. F.	5	2	2	11			7	8	7			2		3	4½	6	1½	1			60
		*Below 200 S. F.	24	27	14	11	31	31	24	22	15		31	12	31	13	24½	11	27	30	31	31	440½

* Of the 440½ days shown below 200 second feet, 285 or 64.8% were below 50 second feet.

COMPARISON OF RECORDED DIVERSIONS FROM RIVER, CANON CITY TO HOLLY, WITH TOTAL RIVER FLOW INTO KANSAS AT STATE LINE

AUGUST—20-YEAR PERIOD

(From Kansas Exh. 71 to 90, Inc.)

		Quantities of Water in Second Feet	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	Total days.
Number of Days in Month when COLORADO'S Recorded Diversion from Canon City to State Line—	WERE	Above 3000 S. F.	7		15	7	5			4			8	15		4		3		14			82
		From 2000-3000 S. F.	7		5	14	17	9	2	5	22	20	3	7	1	9	7	25	9	16	6		184
		From 1000-2000 S. F.	17	19	11	10	9	22	29	20	9	11	19	9	30	18	24	3	22	1	25		308
		From 750-1000 S. F.		12						2			1										15
Number of Days in Month when Water passing across the State Line in Kansas—	WAS	Above 1000 S. F.	8		12	16	4			2½	9½	21	1	28½		5		20½		10	2		140
		From 500-1000 S. F.	4		3	6	2	1		4	5½	6	4	½		6		.8		7	3		66
		From 200- 500 S. F.	4		2	3	3	1	1	3½	2	4	6	2		5		1½		8	12		58
		*Below 200 S. F.	15	31	14	6	22	29	30	21	14		20		31	15	31		31	6	14	31	361

*Of the 361 days shown below 200 second feet, 238 or 65.9% were below 50 second feet.

COMPARISON OF RECORDED DIVERSIONS FROM RIVER, CANON CITY TO HOLLY, WITH TOTAL RIVER FLOW INTO KANSAS AT STATE LINE

SEPTEMBER—20-YEAR PERIOD

(From Kansas Exh. 71 to 90, Inc.)

		Quantities of Water in Second Feet.	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	Total days.
Number of Days in Month when COLORADO'S Recorded Diversion from Canon City to State Line—	WERE	Above 3000 S. F.																					
		From 2000-3000 S. F.						3	2		4	4		12		1		2		18	c 9		55
		From 1000-2000 S. F.	20	14	30	30	25	25	28	24	26	24	6	18	4	21	1	28	12	4	21		351
		From 750-1000 S. F.	10	16			5	2		6		2	24		26	8	29		18	8			154
Number of Days in Month when Water passing across the State Line in Kansas—	WAS	Above 1000 S. F.	3								1			27									31
		From 500-1000 S. F.	½			2	2				.8			3				3		3	7		38½
		From 200- 500 S. F.	2½			19	4	1	2½	3	8	3				3		5		8	8		55
		*Below 200 S. F.	24	30	30	18	24	29	27½	27	13	27	30		30	27	30	22	30	22	15	30	485½

* Of the 485½ days shown below 200 second feet, 287 or 59.1% were below 50 second feet.

(100)

c. Effect of Diversions for Storage in Colorado on State Line Flow

A part of this invasion of Kansas' equitable share of the water supply which contributes to the over-all effect is that of reservoir storage. A knowledge of the performance of reservoirs is necessary because of the changes in river flow resulting from storage and release in various parts of the river basin, and the resultant effect on state line outflow (R. 1523).

If reservoirs are used to store water in years of low runoff the effect of the Colorado reservoirs has been to diminish materially the river flow during the growing season which passes into Kansas (R. 1525). The water impounded in reservoirs is largely lost to the stream flow outside the state (R. 1525). Evaporation of water stored in reservoirs in the plains area is heavy during the summer months, and is a total loss to irrigators in Colorado and Kansas (R. 1525). The manner in which this form of water depletion takes place in Colorado without regard to the requirements in Kansas for water for direct irrigation uses, is shown by such evidence as is available reflecting the storage gains of reservoirs in Colorado and the time when storage takes place. At page 664 of the transcript of record in the original Kansas-Colorado case, as to the

construction of reservoirs in Colorado, Mr. Carpenter (main witness for the State of Colorado) says, quoting Major Powell:

> "The irrigating season on this river is, on an average, something more than two months, while the waters run to waste for more than nine months. It is this waste water that is to be stored in the mountains. Whatever is thus stored will decrease the volume passing the Kansas-Colorado line during the nonirrigating season, but will greatly increase the volume passing that line during the irrigating season; and, as in the case of the South Platte, *the prospect for irrigation in western Kansas depends upon the storing of water in Colorado. The greater the storage the greater will be the area irrigated in Kansas.*"

Such statement has in fact proved to be erroneous in view of the fact that all such storage has been used in Colorado and has acted to deplete the available water supply in Kansas.

Reservoir storage in Colorado during the growing season generally deprives Kansas irrigators of water (R. 1525). The administrative practice in Colorado is such that water can be impounded in reservoirs only when it is not required for direct irrigation. As long as a man wants to exercise his priority and divert water, and has a need for water, the reservoir cannot divert it. The

irrigator's demand for direct river flow must be first satisfied from stream flow before a reservoir has a right to impound water from the same source (R. 1527). No consideration whatever is given to whether irrigation needs in Kansas have been satisfied before impounding is permitted to take place in Colorado (R. 1527). Thus, the irrigator in Kansas secures water from river flow during the growing season only when the needs of all the Colorado irrigators in Colorado have been satisfied, or when the reservoir storage is filled, or else when there is such flash flow in quantity for a few days in the river that (Colorado) canal capacities are insufficient to divert it either for irrigation or storage purposes (R. 1527). There are many instances during the irrigating season when the water supply in Kansas is woefully inadequate for irrigation needs, while impounding is actually taking place in Colorado (R. 1553).

The opportunity for storage in Colorado can be exercised prior to the opportunity to divert water for irrigation in Kansas. This imposes a further depletion of water opportunity on Kansas users to the extent of their ability to divert water runs not demanded by the Colorado ditches for direct diversion for irrigation uses which otherwise would pass into Kansas.

It is unfortunate that failure of Colorado to maintain records of the actual amount of water stored prevents detailed certainty, but records are available from 1912 to 1931 with the exception of two years of the amount of water in storage in Colorado reservoirs on November 1 of each year. This does permit us to secure a general picture of the amount withheld from Kansas use during the irrigation season, since such amounts as the records show were stored and held over till the next season can be compared with the use of water in Kansas during the period of crop needs, from which use water was withheld for storage above. A tabulation making this comparison follows. The record shows that while Colorado diversions during May, June and July were reducing state line outflow to a point where its practical use for irrigation purposes was almost impossible, there was being built up in Colorado reservoirs thousands of acre-feet of storage water, withheld from stream flow for carry over to the following year.

	Water Storage in Arkansas Basin Reservoirs in Colorado on November 1. (R. 1554-1555)	*Number of Days during May to September period when State Line Flow was less than 200 second-feet (Tables pages 98 to 100 of brief)*
1912	131,000 acre-feet	109 out of 152 days
1913	29,000 acre-feet	144 out of 152 days
*1914	181,000 acre-feet	61 out of 152 days
*1915	488,000 acre-feet	45 out of 152 days
1916	145,000 acre-feet	134 out of 152 days
1917	Report imcomplete	150 out of 152 days
1918	105,000 acre-feet	137½ out of 152 days
1919	No published report	119 out of 152 days
1920	137,000 acre-feet	97½ out of 152 days
*1921	176,000 acre-feet	61 out of 152 days
1922	49,000 acre-feet	133 out of 152 days
*1923	396,000 acre-feet	48 out of 152 days
1924	135,000 acre-feet	121 out of 152 days
1925	117,000 acre-feet	102 out of 152 days
1926	86,000 acre-feet	110½ out of 152 days
1927	194,000 acre-feet	94 out of 152 days
1928	194,000 acre-feet	98 out of 152 days
1929	239,000 acre-feet	144½ out of 152 days
1930	193,000 acre-feet	107 out of 152 days
1931	37,000 acre-feet	136 out of 152 days

*Years omitted from Meeker's determination of dependable water supply, because exceptionally high water years.

Of these years above tabulated there are seven years, 1926-1931, when due to monthly reports the net gain by months is reflected. These records were started in 1926.

A tabulation of only the net increases in water storage annually, and the net quantities stored for the period May to August, taken from Colorado Exhibit 146, is as follows:

Year	Net Gain in Storage May, June, July and August	Net Gain for Year
1926	94,100 acre-feet	179,400 acre-feet
1927	189,500 acre-feet	260,300 acre-feet
1928	234,700 acre-feet	292,500 acre-feet
1929	112,600 acre-feet	304,600 acre-feet
1930	39,400 acre-feet	142,300 acre-feet
1931	8,800 acre-feet	83,400 acre-feet
1932	37,545 acre-feet	75,100 acre-feet

Actual amounts of water stored were necessarily far greater than the above tabulation shows. This is because drawoff during the irrigation season for irrigation is heavy and the losses through evaporation great. Particularly during the period May to August inclusive water is generally being withdrawn for irrigation. The amounts in the above table are net gain only, the quantity of actual withdrawal for storage from stream-flow to replace all quantities used cannot be ascertained. The effect of this river depletion on Kansas irrigation is indicated by a comparison in tables on pages 96 to 100, inclusive. In 1926, during the May to August period, during which 94,100 acre-feet were impounded, there were 81 days of the May to August period in which the flow across the state line was less than 200 second-feet, and of these 47 were less than 50 second-feet. During the same period, 1927, when 189,500 acre-feet were impounded, there were 72 days, May to August, inclusive, when the flow across

the state line was less than 200 second-feet, and of these 70 were less than 50 second-feet. In the same period, 1928, when 234,700 acre-feet were impounded, there were 68 days, May to August, inclusive, when the flow across the state line was less than 200 second-feet, and of these 32 were less than 50 second-feet. In the same period, 1929, when 112,600 acre-feet were impounded, there were 93 days, May to August, inclusive, when the flow across the state line was less than 200 second-feet, and of these 44 were less than 50 second-feet. In the same period, 1930, when 39,400 acre-feet were impounded, there were 92 days, May to August, inclusive, when the flow across the state line was less than 200 second-feet, and of these 49 were less than 50 second-feet. In 1931, when 8,800 acre-feet were impounded, there were 106 days, May to August, inclusive, when the flow across the state line was less than 200 second-feet, and of these 66 were less than 50 second-feet.

These figures, comparing the net increases to storage during the very heart of the growing season in Colorado, and the flow across the state line day by day, show something of the effect of diversions for storage alone in Colorado upon the water supply now reaching Kansas, and from which diversions in Kansas must be made.

Defendants have dealt at length and somewhat specifically on the foregoing factors, not only because they amply support the Master's Finding of Fact 5, but likewise for the reason that they support the requested additional finding of fact contained in defendants' Exception 7 as follows:

> "Colorado, being the upper state, has the first opportunity to divert and use the waters of the Arkansas River for irrigation purposes, and has so diverted and used said waters to the extent that users in Kansas have been deprived of practically all of the dependable flow of the stream. Such water as at present passes across the state line into Kansas consists of flash floods of a day or a few days duration, most of which is not subject to diversion or use. Water which can be captured from such floods is intermittent and bears little or no relation to crop requirements."

F. EFFECT OF CADDOA RESERVOIR

(Relating to Exception 3)

Even the limited erratic water supply which the record shows passed into Kansas may now be curtailed. This results from the construction and operation of Caddoa Reservoir in Colorado but recently put into operation.

This is a channel reservoir which is able to completely obstruct the flow of the river at a point approximately 50 miles from the Kansas-Colorado line. It will have a capacity when finished of 655,000 acre-feet. It has a present completed capacity of 270,000 acre-feet. This reservoir was built at government expense.

The State of Kansas objected to the evidence respecting this project because it was felt that the equitable apportionment of the natural water supply between the two states was a matter to be determined by consideration of the basic equities, and not be confused by factors not existing at the time the issues were formed, nor being a factor upon which the need or the rights of either state could be determined. The evidence shows that this reservoir has only a limited life of approximately 60 years (R. 6884). These objections were based on the fact that any decree quieting the rights of the respective states in and to the waters of the River which had embodied in its considerations this purely temporary achievement would have embodied therein a fatal defect as a permanent adjudication of rights.

All water which heretofore has constituted river flow at that point will be compelled to pass through the reservoir, and can there be impounded. In the area above

that point, which includes most of the Colorado tributaries, and which heretofore permitted some diversion by Kansas ditches in the few days in which such water passed their headgates, can now effectively be captured in this reservoir. Water which passes down stream below that point will be either water released or flood spills when the conservation pool is filled to capacity, which on the basis of Colorado's Exhibit 222, page 6750, would have occurred in only nine out of 31 years on an assumed operation of this structure from 1908 to 1938.

The completion of this reservoir may be used to restrain the majority of those vagrant waters which State Engineer Hinderlider described as escaping into Kansas. State line flow may thereafter be reduced to a few flash floods which might join river flow in the 50 mile strip to the state line. Thus, substantially complete river depletion within Colorado will have become effective.

The facts show that it is not necessary for the gates to be operated to bring about a part of the above described depletion, since even without the installation of gates to be closed for operating purposes the openings in the dam structure are such as to limit and circumscribe the natural flow within certain bounds. The ditches in Colorado below the reservoir have a combined

headgate diversion capacity of 1,712 cubic feet per second. In the years excepting those so-called "big water years" the unregulated operation of the structure would be such as to reduce the quantity of water that is able to pass through its open gates to a point where the total amount passing through could practically all be used by Colorado ditches below the reservoir (R. 7010). In that case the water passing the state line would be such water as comes in from flash floods from the tributaries below the last of the Colorado ditches.

The water produced below Caddoa cannot be controlled in any way by this reservoir. The flow originating below Caddoa, particularly the summer flow, is very erratic. A storm may occur over that portion of the basin and there will be a heavy flow for one or two days, and then as far as the natural water of that area is concerned it may be weeks, or even several months, in the summer until there is an appreciable summer runoff in that part of the drainage basin (R. 7072).

After construction of the gates, if the gates and the conduits are closed and used to regulate the flow of the stream, the structure can regulate the flow of the river from any desired releases from one or two cubic feet

per second, up to 1,000 feet or more, depending on storage in the reservoir (R. 7008).

The years when the conservation pool up to spillway crest might not control the water if releases were made as rapidly as diversions could be made below, is indicated in Colorado Exhibit 202 showing flood spills. In nine years of the 31 indicated there would have been flood spills ranging from a small amount to large amounts, and that would be very nearly the number of years and the same years when Caddoa could not be operated to completely control the stream below (R. 7009).

As stated above in the years excepting those so-called "big years" the structure could be operated so as to regulate the supply of water passing through it to a point where it could all be used by the Colorado ditches below the reservoir (R. 7010).

We do not intend by the foregoing statements to indicate a permanent condition, since the record indicates an effective life of this reservoir of approximately 60 years (R. 6687). According to Mr. Patterson, the rate of siltation is 6,330 acre-feet per year. There is a substantial agreement on this siltation rate by Mr. Knapp, State Engineer of Kansas, and on such basis we can

accept as a fact that the probable life of the reservoir will not be more than a few years at the most longer than the 60 years set by these men.

The Caddoa reservoir belongs neither to Kansas nor Colorado. As a factor in this interstate water problem it will function on the same basis as every other reservoir constructed in Colorado in the Arkansas basin as a unit of regulation to capture surplus flood waters, and thereby complete in the most effective means possible the depletion of stream flow into Kansas. The capacity of the conservation pool, 385,000 acre-feet, represents its depletion possibility. Like the other 33 reservoirs in Colorado, with a storage capacity of 539,151 acre-feet, it represents purely an additional agency for depletion of water supply into Kansas. It is not an element which has any part in determining what equitable apportionment of the water supply should be adjudicated as belonging to the State of Kansas in her sovereign capacity. Only when a decree is entered, upon the basis of which delivery of water to Kansas can be compelled, does it enter this controversy, and then only as an agency along with other Colorado reservoirs or other Colorado sources of supply whereby replacement of water withheld from

Kansas can be replaced in a practical and effective manner.

The contemplated use of this reservoir is indicated in the 24th biennial report of the State Engineer of Colorado, where it was said, "It has been estimated that this reservoir should equalize the discharge of the river at a point to an average annual delivery of 153,000 acre-feet, the use of which would develop an additional 50,000 acre-feet of return flow, making a total of 200,000 acre-feet of additional water supplies now badly needed to supplement existing decrees. This usage of water would be made possible through a system of exchange above the reservoir and upstream canals." This statement not only reflects the estimated amount of the State Engineer of Colorado, but the intention at that time of the administrative authorities of Colorado to completely appropriate for Colorado's use this water which formerly passed across the state line into Kansas.

It is on the basis of the foregoing facts, and in order to present more clearly to this court the exact situation facing the Kansas irrigators, that defendants in Exception 3, which with some changes in wording with respect to the language used by the Master in the second para-

graph of the third Finding of Fact, have requested that there be found as an addition the following:

> "and with the construction of the channel reservoir known as the Caddoa Reservoir now completed to the extent of storage of 270,000 acre-feet, and with ultimate storage capacity of 655,000 acre-feet, the larger portion of the water supply hitherto passing across the state line into Kansas can be captured and conserved in said Caddoa Reservoir."

G. EQUITABLE APPORTIONMENT

(Relating to Exceptions 7, 9, 11 and 12, and Exceptions 1 and 2 to the Recommended Decree)

The Master, having found the average dependable water supply of the basin to amount to 1,110,000 acre-feet (Finding of Fact 6), arrived at an equitable apportionment of such supply on the basis of 925,000 acre-feet to Colorado and 185,000 acre-feet to Kansas, of which 150,000 should be delivered between April 1 and October 1, 35,000 between October 1 and April 1 (Findings of Fact 8 and 9). He likewise found that in the event of a deficiency or increase in the flow of the River and its tributaries, the supply should be pro-rated in relation to the dependable average amount awarded to Colorado and to Kansas (Findings of Fact 8 and 9).

Since it is an undisputed fact that the water supply is a constantly varying amount, proration on the basis of the equitable apportionment can be maintained only by a definite provisions for the ratio of division to be maintained at all times. It is clear that in Finding 8 the Master has awarded five-sixths of the average annual dependable supply to Colorado; it is likewise apparent that he has awarded one-sixth of the average annual dependable supply to Kansas. Therefore, in order to permit the administrative control to properly pro-rate the supply as it fluctuates, defendants have requested that the percentages, namely 83.33 percent and 16.67 percent, be included in the Master's findings in order that a fixed ratio can be maintained dealing with any given quantity of water at any particular time.

Defendants also in these exceptions have requested a modification of certain language which we believe was inadvertently used in Finding 9, and Conclusion of Law 3, in order that it may be reconciled with paragraph 2 of the Proposed Decree. The court will note that in paragraph 2 of the Proposed Decree the language is clear that the 185,000 acre-feet allocated to Kansas should be delivered at such times and in such amounts

as and when required by water officials of the State of Kansas.

Inasmuch as the 185,000 acre-feet allocated to Kansas is approximately 75,000 acre-feet less than the average annual amount passing across the state line in the past, but which was largely unusable as heretofore pointed out in this brief, it is apparent that it was the intention of the Master that this smaller quantity should be made usable by having it delivered in conformity with irrigation needs on demand of the Kansas state water officials. This was considered easily feasible, because the construction of Caddoa Reservoir across the channel of the River added to all other existent reservoir storage in Colorado. Most of the hitherto uncontrolled flood waters would be subject to capture and control within the confines of the State of Colorado. However, in both Finding 9 and Conclusion of Law 3 this ambiguous language has been used: "at such times and in such amounts of the 35,000 acre-feet as the same could be delivered for irrigation or storage when required by the water officials of Kansas." This might be construed by some to mean that only the winter water would be delivered on demand of the water officials.

While storage, or even recharging of ground water, might be possible from the winter delivery, it is absolutely certain that the same never could be delivered to serve the purposes of irrigation, and the use by the Master of the words "delivery for irrigation when required by the water officials" indicates that the deliveries on such basis relate to the entire annual supply. However, since the language is meaningless, defendants have asked for the deletion of the words "of the 35,000 acre-feet as the same could be delivered for irrigation or storage when," in order that the language will conform to paragraph 2 of the Proposed Decree.

In the light of the previous portions of this brief relating to the present character of the water supply, unless delivery can be compelled by the water officials of Kansas of their portion of the supply in conformity with irrigation needs, all that Kansas would receive would be a continuation of a few flash floods.

H. REQUIREMENT OF DECREE WHICH WILL PROTECT AND INSURE DELIVERY AT THE STATE LINE OF KANSAS' SHARE IN ACCORDANCE WITH IRRIGATION REQUIREMENTS

(Relating to Exceptions 10 and 13, and Exception 3 to the Proposed Decree)

1. Method to Be Used

The Master has determined the equitable apportionment of the water supply of the Arkansas River basin, five-sixths to Colorado and one-sixth to Kansas. The requested inclusion of 83.33 percent to Colorado and 16.67 percent to Kansas fixes a ratio, whereas the same apportionment may be maintained in distribution of a fluctuating water supply.

We now turn in this section of the brief to a discussion of the more complicated problem of how delivery of the apportioned supply to Kansas can be made in such manner as to insure water users in the lower state the same degree of utility for irrigation as that enjoyed by the upper state. As has been shown in this brief, mere quantity of water is valueless, unless the same is made available in conformity with crop requirements. The Special Master has dealt with this problem in Finding of Fact 12, Conclusion of Law 5, and paragraph 8 of the Proposed Decree. Clarification of the language used

therein has been raised by defendants' Exception 10 at page 11, Exception 13 at page 17, and Exception 4 at page 24 to the Proposed Decree. This problem of delivery is complicated by four factors:

1. Colorado, as the upper state, has the first opportunity to divert the usable water to satisfy existing demands, and if delivery to Kansas is to be protected such Colorado uses must be placed under definite and clear administrative restraint.
2. Colorado's ditch decrees for diversion are in terms of second-feet, thus a ditch with a decree of 200 second-feet may divert that amount of flow each day in its order of priority as long as there is any water flowing in the channel of the stream.
3. Colorado reservoirs also divert such water as remains which can be captured, and then hold the same for use in Colorado.
4. Some 195,000 acres of land are irrigated on the tributaries with water which, because of such use, never is permitted to reach the main channel of the stream so as to be measurable as stream flow.

Such acreage under irrigation in 1930 is reflected in Kansas' Exhibit 57, R. page 1513, and Kansas Exhibit 24, R. page 1462:

Water District 12	*Acres*
Tributaries below Canon City	11,000
Fountain	20,300
St. Charles	10,700
Huerfano	53,200
Apishapa	5,700
Purgatoire	39,500
Main valley side streams	12,600
Irrigated above Canon City	42,800

Because of these factors any decree entered by this court must protect deliveries to Kansas against the depletion possibilities of the foregoing factors, if the water apportioned to the lower state is to be delivered at the state line.

There are as defendants view it only two practical and permanent methods of insuring the delivery of its equitable apportionment as dependable flow to Kansas. The first method is by a definite interstate water schedule, specifying water deliveries month by month in accordance with past river performance and irrigation demands (R. 1744). In support of this solution an interstate water schedule, namely Schedule C, was submitted in evidence, being Kansas Exhibit 99, R. page 1750, which was based upon an equitable apportionment of 24 percent of the average yearly water supply, and but 27 percent of the average yearly dependable flow. This exhibit is as follows:

January and December, approximately in round figures	50 second-feet
February	110 second-feet
March	145 second-feet
April	250 second-feet
May	730 second-feet
June	1,250 second-feet
July	970 second-feet
August	480 second-feet
September	350 second-feet
October	190 second-feet
November	100 second-feet

However, reduced to terms of 185,000 acre-feet, or 16.67 percent of the average dependable supply, the amount allocated to the State of Kansas by the Special Master, the monthly delivery schedule would appear as follows:

Month	*Av. Flow (sec. ft.)*	*Monthly Totals (ac. ft.)*
January	32.7	2,010
February	71.9	3,995
March	94.8	5,830
April	163.5	9,726
May	477.3	29,351
June	817.3	48,632
July	634.2	39,000
August	313.9	19,300
September	228.9	13,617
October	124.2	7,639
November	65.4	3,890
December	32.7	2,010
Total		185,000

The difficulty with this method is that it provides deliveries in constant amounts each year to Kansas, re-

gardless of the quantity of the fluctuating water supply. Applying the operation of this schedule to the determined Colorado water supply from 1895 to 1930 (Kansas Exhibit 70, found at page 77 of this brief, it would operate adversely to Colorado in 12 years of the 36-year period, when the water supply fell below the average annual dependable supply, and would operate adversely to Kansas in the 22 years when the water supply was above the average annual dependable flow.

The Master did not adopt this comparatively simply administrative method of protecting and insuring delivery to Kansas in favor of a plan of delivery whereby the burden of dry years would be borne by each state in the same proportion as the equitable distribution of water was decreed (Finding of Fact 12). The equity of this method is apparent, but the administrative problem of determining the water supply of the entire basin, which is subject to division, and providing for its delivery each day as it originates is somewhat complicated and requires the clearest definition of its details in the decree, if the equitable apportionment prescribed by the Master is to be preserved and the ratio of delivery insured.

While the ultimate determination of the original water

supply of the basin, annually, monthly, or even daily, is a comparatively simple engineering problem, and has been most accurately ascertained in this case over a period of 36 years, it requires time, the assembly of innumerable records, and an engineering staff, which would introduce a considerable time lag in the ascertainment of the facts, and would make such character of determination impractical and too expensive from an administrative standpoint.

If water is to be delivered each day, the amount available for delivery must be determined each day and protected against upstream consumption. Again, if we approach the problem from the standpoint of the actual measure of water as it originates, even innumerable gauging stations recording the flow would not be able to measure the actual water supply of the basin, since irrigation on the tributaries to the extent of 195,000 acres (see Kansas Exhibits 57 and 24 heretofore referred to) would have consumed a considerable part of the supply before the same ever reached the main channel of the stream, and likewise innumerable small tributaries contributing surface runoff throughout the basin would escape accurate measurement.

However, a solution to this problem of determining

the daily water supply as it originates exists which is practical and fairly inexpensive from an administrative standpoint. This can be accomplished by the selection of two gauging stations having long time records, where the relationship of the flow passing those stations to the total basin water supply can be ascertained with reasonably accuracy. Such stations can be selected so that they serve as an index of the water supply of the basin as it originates (R. 7016), and from which the total basin water supply can be computed.

This is the plan adopted by the Special Master, and is shown in the Master's Finding of Fact 12, the first part of which reads as follows:

> "The water supply of the basin comes from two distinct sources, the mountain water supply and the plains water supply, the first is irregular in its occurrence as the rise of the streams occurring with melting snows and the other, or plains runoff being erratic, sometimes large and sometimes small. (*R. 7016.*) Two designated measuring points should be established, one of which will serve as an index of mountain water supply and another station selected which will serve as an index of the plains water supply. The water measured at those stations will vary up or down as those two types of the water supply in the basin varies (*R. 7017*) and the burden of benefits of wet years and dry years would be borne in the

same proportion as the equitable distribution of water supply is decreed." (Italicized record pages ours.)

Naturally the stream flow passing such stations will represent only a portion of the total water supply of the basin, since irrigation uses above and on all the tributaries, together with all inflow below them, will not be there recorded. However, with the ratio which the water supply passing these stations bears to the total basin water supply over a long time period, a known factor, it becomes a comparatively simple matter to compute or determine from the measured water passing these index stations the total water supply of the basin, and from the quantity so computed or determined effectuate the apportionment of 83.33 percent to Colorado and 16.67 percent to Kansas. This would insure to Kansas water users the same character of supply as that of Colorado, since the division would be based upon the water supply as it was produced.

Defendants' Exception 10 at page 11 to the Master's Finding of Fact 12, Exception 13 at page 17 to Conclusion of Law 5, and Exception 3 at page 22 to paragraph 4 of the Proposed Decree, are not directed to the plan found by the Master as the desirable one to be em-

bodied in a decree, but the exceptions are directed to some of the language used which is susceptible of misinterpretation unless the ratio which the water passing the two index stations selected bears to the total water supply to be determined, so that from an administrative standpoint the manner in which the flow passing such two stations is to be used to compute the water supply subject to division is clearly shown.

The stations selected by the Special Master, namely, Canon City where the Arkansas River emerges from the Royal Gorge, and the Purgatoire River at its mouth, were those taken from Kansas Exhibit 134, R. page 7019, which is here set out in full for the sake of ready reference.

A Suggested Permanent Method of Division of the Water Which Will Also Protect Storage in and Utilization of Caddoa Reservoir through Key Measuring Stations Above

ACRE-FEET

Year	Corrected Arkansas River at Canon City	Purgatoire River at Mouth (Col. Ex. 204)	Total	Fifty Percent of Total
1908	396,271	83,631	479,902	239,951
1909	701,970	155,120	857,090	428,545
1910	567,408	77,386	644,794	322,397
1911	701,618	42,723	744,341	372,171
1912	671,535	89,740	761,275	380,637
1913	685,752	31,926	517,678	258,839
1914	721,900	204,360	926,260	463,130
1915	546,000	174,260	720,260	360,130
1916	685,620	61,524	747,144	373,572
1917	670,580	61,805	732,385	366,192
1918	636,920	79,870	716,790	358,395
1919	639,250	103,530	742,780	371,390
1920	688,640	71,179	759,819	379,910
1921	717,850	84,556	802,406	401,203
1922	560,310	25,700	586,010	293,005
1923	701,890	390,404	1,092,294	546,147
1924	671,000	54,611	725,611	362,805
1925	427,900	89,556	517,456	258,728
1926	547,540	84,970	632,510	316,255
1927	600,700	204,774	805,474	402,737
1928	569,430	115,235	684,665	342,333
1929	628,420	131,644	760,064	380,032
1930	521,200	119,383	640,583	320,292
1931	342,349	58,801	401,150	200,575
1932	518,097	22,834	540,931	270,466
1933	448,698	67,234	515,932	257,966
1934	310,238	29,822	340,060	170,030
1935	515,306	69,025	584,331	292,166
1936	627,419	66,756	694,175	347,088
1937	416,220	72,479	488,699	244,350
1938	554,850	64,070	618,920	309,460
Average	573,964	96,416	670,380*	335,190

* 670,380 acre-feet is between 52 percent and 54 percent of the average yearly water supply of the basin in Colorado—1,240,000 to 1,290,000 acre-feet—Kansas Exhibit 63.

It will be noted that the long time average amounts to 670,380 acre-feet, and that this represents 54 percent of the average annual water supply of the basin found by the Master to amount to 1,240,00 acre-feet. The difference between these two amounts represents that portion of the water supply which is consumed in Colorado by irrigation uses above the two selected index stations, or which flows into the stream below such stations through the other numerous tributaries in Colorado contributing to the basin supply.

Since the water supply, therefore, passing these two stations represents but only 54 percent of the average annual supply as it originates, these two stations taken together constitute an index, and an index only, on the basis of which on any given day or period the water supply, subject to division and allocation between the states, can be determined by computation. One-sixth of the amount so determined is the water supply deliverable to the State of Kansas at the state line, in accordance with the apportionment made by the Special Master, and five-sixths becomes immediately available for Colorado use.

The difficulty with the Special Master's finding is that it does not clearly reflect what percentage of the measured water passing such index stations will equal the

percentage of the total supply allocated for delivery to Kansas. Since the two index stations represent only 54 percent of the total water supply of the basin, then in order for Kansas to receive 16.67 percent of the basin water supply in accordance with the Master's apportionment, 30.87 percent of the water supply passing the two index stations represents the deliverable amount to Kansas when and as the supply accrues. For example: If we assume that in a given year 500,000 acre-feet of water passes the two index stations, since this amount represents 54 percent of the basin water supply the total basin supply in that particular year would amount to 925,900 acre-feet. This divided between the two states according to the apportionment made by the Special Master of one-sixth to Kansas and five-sixths to Colorado, would mean that approximately 154,000 acre-feet would be deliverable at the Kansas-Colorado line for Kansas use, and 771,000 acre-feet would be available for Colorado use. Or, if we use the definite index figure of 30.87 percent of the supply passing the index stations, we arrive at the same apportionment, namely 154,000 acre-feet to Kansas and 771,000 to Colorado.

It will be noted that this is a lean water year, where, as reflected in the Master's Report, the burden would be

borne by each state in accordance with the ratio of apportionment. On the other hand, let us assume that the water supply passing the index stations amounted to 800,000 acre-feet. Since this represents 54 percent of the total water supply, the water supply would be computed at 1,481,400 acre-feet. The deliverable amount to Kansas would amount to 246,900 acre-feet, or one-sixth; the amount available to Colorado 1,234,000 acre-feet, or five-sixths. Or, to use the index ratio of 30.87 percent, we find exactly the same result of 246,000 acre-feet to Kansas and 1,234,000 to Colorado. The effectiveness of this method of determination is that from an administrative standpoint the quantum of deliveries to Kansas can be determined each day as the water supply originates and ample protection afforded.

Again for illustration: Assuming that on a given day the water supply passing the index stations amounted to 4,000 acre-feet. That amount being 54 percent of the water supply of the basin, we would have available approximately 7,400 acre-feet for irrigation purposes. One-sixth of this would be the equitable share subject to delivery to Kansas, or 1,240 acre-feet, with 6,160 acre-feet available for Colorado use. Or, to use the index ratio of

30.87 percent of the index flow, the deliverable portion to Kansas would amount to 1,240 acre-feet.

It is apparent from the Master's Finding of Fact 12 at page 12, and his Conclusion of Law 5 at page 16, that this index station method which we have here explained is the method which the Master felt would adequately protect deliveries to Kansas in conformity with the water supply as it originated, so that Kansas would have the benefit of a flowing stream. Defendants' exceptions directed to these findings are not with respect to the method, but only seeking to clarify the language, and provide for the definite percentage of the flow passing the two index stations, which will insure a delivery of the one-sixth of the water supply determined by the Master to be Kansas' equitable share. Defendants have accordingly suggested that the Master's Finding of Fact 5 be modified as follows:

> "There is required to be established by the states of Colorado and Kansas ~~three~~ modern measuring devices at *two* stations *herein named, which shall be used* to accurately measure the *flow* of water *passing such stations* ~~supply of the Arkansas River and the flow of the river and its tributaries~~, one of which is to be located at a station at Canon City, Colorado and one to be located near the mouth of the Purgatoire River. *The recorded flows of water pass-*

ing such two stations shall serve as an index from which may be computed for the purpose of apportionment the total water supply of the Basin when and as the same originates. Thirty and Eighty-seven hundredths percent (30.87%) of the water passing such station, which is sixteen and sixty-seven hundredths percent (16.67%) of the total Basin water supply, shall be the amount of water which accrues to Kansas as its equitable share and which is subject to delivery at the state line, and an equivalent amount of water shall, after the same accrues, be delivered by the State of Colorado at the state line as required by the Kansas state water officials. ~~and another~~ A third station ~~shall be established~~ where the water shall be accurately measured, located on the river at the Colorado-Kansas state line to ~~determine~~ *record* the amount of water ~~flowing in the river that should be~~ delivered to the State of Kansas *day by day pursuant to the apportionment herein determined as such water supply is computed through the use of said index stations as having accrued for delivery to Kansas, but the amounts of water passing such station in daily amounts larger than the accrued amounts as shown by said index stations, shall be classed as flood waters and shall not constitute a delivery under the allocation herein unless the same shall have been made pursuant to the request of Kansas state water officials.* ~~and~~ The expense of the construction and operation of the measuring devices shall be equally borne by the states of Colorado and Kansas, and in the event the two states are unable to agree upon one to so construct and operate the same, then the court should appoint someone to construct and

operate such measuring devices." (Defendants' Exception 13, pages 18 and 19.)

While the foregoing discussion of the use of the index percentage to determine the water supply relates to the most important modification of Finding of Fact 12, three other modifications are embodied in defendants' exception to this finding.

2. Recording of Water Deliveries to Kansas at the State Line

The first of these relates to a clarification of language concerning the purpose and use of the measuring station at the Kansas-Colorado line. Respecting this station the Master used the following language:

> "And another, a third station, shall be established where the water shall be accurately measured located on the River at the Colorado-Kansas state line to determine the amount of water flowing in the River that should be delivered to the State of Kansas."

This language is ambiguous and confusing. Such designated station, located below all Colorado irrigation uses, could not possibly be used to determine the water which should be delivered to the State of Kansas. It obviously represents the control point to record the amount of water that is actually delivered to Kansas in conformity

with the apportionment computed by the use of index stations.

Of the three stations designated by the Special Master, the two stations located at Canon City and near the mouth of the Purgatoire are designated as index stations. They are used for the purpose of computing the water supply as it originates in order to ascertain the amount of water Colorado is obligated to deliver at the state line to effectuate the equitable apportionment decree. These two stations therefore serve the entire purpose of computing the water that is to be delivered. But the third station located on the River at the Colorado-Kansas line is for the purpose of ascertaining by the flows passing such station whether the deliveries have been made.

Defendants have therefore requested that the Master's language relating to the station at the Colorado-Kansas line be clarified in conformiy with the foregoing discussion by stating:

> "A third station should be located, and a measuring devise established, at or near the Colorado-Kansas state line to measure the amount of water as herein apportioned which is delivered to the State of Kansas, such deliveries to be measured day by day as the basin water supply originates and is computed through the use of the said two index stations."

3. Delivery of an Equivalent Amount Equal to Kansas' Share Computed at Index Stations

The second modification suggested by the defendants to Finding of Fact 12 is indicated by the last portion of the following sentence:

> "30.87 percent of the water passing such station, which is 16.67 percent of the total basin water supply, shall be the amount of water which accrues to Kansas as its equitable share, and which is subject to delivery at the state line, and and equivalent amount of water which, after the same accrues, be delivered by the State of Colorado at the state line as required by the Kansas state water officials."

What is obviously desired from an administrative standpoint is to secure the most effective use of water in Colorado commensurate with adequate protection to Kansas of a delivery of its equitable share as a usable supply in conformity wtih irrigation needs. The index stations are used for the purpose of computing the water supply as it originates, and for determining the amount which accrues to Kansas for use therein, and with respect to which Colorado is charged with the delivery thereof.

30.87 percent of the water recorded at the index station therefore becomes a credit item on the Kansas ac-

count, which Colorado is obligated to deliver to Kansas as it originates. However, a very considerable amount of the water supply available for irrigation uses passes into the stream below the index stations. But these stations having served their purpose in determining the daily deliverable quantity of water, Colorado should be able to make such delivery from any other water flowing in the stream which may be available for such purpose. There are three such available sources below the index stations. (1) Very considerable quantities of water pass into the stream through tributary inflow. (2) Large quantities of seepage and return flow, resulting from irrigation uses along the main stem of the stream to the amount of 214,000 acre-feet (Kansas Exhibit 32, R. 1483-84) return to the stream for further use. (3) Likewise, it is clear that there is tremendous storage capacity available in Colorado below the index stations. In the Caddoa channel reservoir alone a considerable portion of the flash floods hitherto passing across the state line will be impounded and controlled, and thus serve as a back log of water resource available to satisfy deliveries of water to Kansas as the same accrues. The Colorado administrative authorities will find that the amount credited for delivery to Kansas can be

satisfied from water originating or impounded lower down on the stream, thus permitting their full use of such water as might pass the index stations. For these reasons it appears desirable that it be made plain in any finding that the amount which accrues to Kansas may be satisfied by the delivery of *an equivalent amount of water after the same accrues, as reflected by the index computations.* However, if Colorado is to have the right to withhold water in the interest of a more efficient administration, then on demand of the Kansas water officials such water should be compelled to come down the stream for delivery at the state line upon demand of the Kansas water officials up to the extent which the index stations indicate have accrued to the credit of Kansas use. This reflects the manifest intention of the Master, as indicated by language used in paragraph 2 of the Proposed Decree, where the allocation to Kansas is required to be delivered to Kansas at the Colorado-Kansas state line at such times and in such amounts as and when required by water officials of the State of Kansas.

4. Protection to Kansas Apportionment Against Being Satisfied by Unusable Water through Flash Floods

As has heretofore been pointed out in this brief, flash floods passing across the state line contribute in some instances large volumes of water which are unusable for irrigation purposes. While the operation of Caddoa reservoir may capture a considerable portion of this unusable flood water, and make it usable upon release, still there are bound to be in isolated years some floods which originate below the dam site, which would put large quantities of unusable water across the state line without it serving any irrigation purpose.

With the small apportionment, obviously intended to be usable water, made to Kansas by the Master, any decree entered should afford adequate protection to Kansas against large flash floods contributing large quantities of unusable water, so that such could not be charged as a delivery against the Kansas accrued amounts. To meet this situation we believe fairly, defendants have requested in the modifications to the Master's Finding of Fact 12 the following language:

> "Daily amounts passing state line stations in quantities larger than the amounts computed from the index stations as accruals for delivery shall

> be classed as flood water and shall not be considered as a delivery under the allocation herein."

As can readily be seen, this modification in no sense destroys the effect of such usable amounts as may be captured from such flood flows, since such suggested modification expressly provides for a delivery charge up to the extent of the daily usable flow accruing to Kansas as computed from the index stations.

Inasmuch as defendants' Exception 13 to the Special Master's 9th Conclusion of Law, and Defendants' Exception 3 to paragraph 4 of the Proposed Decree, embodied the same language and relate the same character of modification, the foregoing argument applies with equal force to these exceptions and will not be repeated.

I. WHY ENJOIN KANSAS?

(Relating to Exception 14, page 19, and Exception IV, to Recommended Decree, page 24)

The Master in his 9th Conclusion of Law has used the following language:

> "That the States of Colorado and Kansas and each of them and their officers, agents, representatives and employees are perpetually enjoined from diverting and using any water from the Arkansas River and its tributaries in excess of the amounts awarded and herein decreed to them."

Substantially the same language is used in paragraph 8 at page 22 of the Recommended Decree. The defendants have requested that reference to Kansas be eliminated therefrom. These two exceptions are not of outstanding importance. They are interposed merely to remove from any decree what to defendants seems an utter inconsistency.

It should be apparent that, with Colorado as the upper state and having the first water opportunity, the State of Kansas will never be able to divert or use water from the Arkansas River, except as the same by force of the decree entered by this court is protected in its delivery against depletions in Colorado which destroy its effectiveness for irrigation uses. Water runs down hill, and Kansas never has nor never will be able to use water in excess of any amount decreed by the court as against the rights of Colorado. The shoe is on the other foot. The perpetual injunction against using water in excess of the decreed amount is a protective measure directed against Colorado, its officers, agents, representatives and employees, in order to protect the deliveries to Kansas in conformity with the decree entered by this court; and defendants merely suggest that an inconsistency of this character, which would indicate a failure

to visualize the true relationship between the upper and lower state, should not find its way into a formal decree entered by this court, even though in practical effect it could never be operative against a commonwealth, which physically is not in a position to ever deplete the waters of the Arkansas River to the detriment of the upper state.

V. CONCLUSION

It has been impossible in this brief to discuss in detail the 39 volumes of evidence and 368 exhibits, some of which contain many pages. The Special Master appointed by this court had the fullest opportunity over the period of nearly a year, and after several days argument by counsel, to weigh this evidence and formulate his report. Defendants assume that, except for basic error, his fundamental findings will not be disturbed by this court. These basic findings, which are amply supported by the evidence, and to which the defendants have filed no exception, are as follows:

1. That the average annual dependable water supply which is subject to apportionment amounts to 1,110,000 acre-feet.

2. That since the taking of testimony in the old Kansas-Colorado case there has been a material increase in the River depletion by Colorado, which has diminished the flow of water into the State of Kansas to the injury of substantial interests in Kansas.

3. That the water supply of the Arkansas basin should be apportioned on a basis of five-sixth to Colorado and one-sixth to Kansas.

4. That the annual supply subject to division should be computed by the use of two index stations designated by the Special Master, so that the division of such ascertained amount could be made as the water supply originates, in order that the burden of dry years and the benefit of wet years would be borne in the same proportion as the equitable distribution of the water supply is decreed.

As hereinbefore stated denfendant's exceptions relating to a modification and clarification of ambiguous and uncertain language therein, are made in order that the manifest intent of the Special Master as reflected in his report could be embodied in the decree with such clarity that the possibility of future disputes respecting its interpretation would be eliminated.

The additional findings of fact, which have been requested in defendants' exceptions, are facts which the Master clearly had before him in his consideration of the evidence. The Master probably felt that these facts were mere stepping stones to his ultimate conclusion, and were therefore not essential for embodiment in his report. Defendants have felt the necessity of presenting to this court through their request for additional findings, the same basic picture as that considered by

the Special Master. This has been done in order that in the clarification of language the manifest intent of the Special Master be preserved, and at the same time adequate protection be afforded to the State of Kansas by the decree, whereby the delivery of a lesser amount of water than now passes across the state line would be insured in conformity with irrigation needs, and likewise in order that this controversy should be adjusted as this court has indicated "upon the basis of equality of rights as to secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of the like beneficial effects of a flowing stream."

In conclusion we suggest that the record proves conclusively:

(1) That the need for irrigation in the arid regions in Western Kansas and in Eastern Colorado is equal.

(2) That under natural conditions agriculture in this region in both states produces the same crops with substantially equal results.

(3) That Colorado's contention that except for irrigation her lands in the Arkansas basin in Colorado cannot support agriculture has been disproved by the actual production of crops on over 1,000,000 acres farmed under dry land conditions.

(4) That the need for water from the Arkansas River for irrigation in order to produce crops of high water requirement, and to secure more satisfactory yields of all crops, was recognized in both states, and the large irrigation enterprises started at substantially the same time in order to realize such benefits.

(5) That Colorado's water users, having the opportunity to utilize and consume the stream flow before it passed into Kansas, have exercised such opportunity so that the only water that escapes across the state line into Kansas are flash floods originating in the lower reaches of the River in Colorado.

(6) That Colorado has consumed and destroyed, and thereby depleted, the water supply of the basin to the extent of at least 85 percent of the average annual supply amounting to 1,240,000 acre-feet or more; and that Colorado has consumed, destroyed and depleted the average annual dependable flow of approximately 1,110,000 acre-feet to the extent of 95 percent.

(7) That stream flow into Kansas across the state line has become so depleted and diminished as to deprive Kansas of any practical benefits from the use of such water, and this is indicated by the fact that the records show that during the months of May to September inclusive

during the span of years from 1912 to 1931 (3,060 days) there were 2,123 days when the flow in the stream crossing the state line was 200 second-feet or less, and of these in 1,359 days there was less than 50 second-feet of flow available for irrigation use.

(8) That Kansas' right to the beneficial use of water from the Arkansas River based upon her equality of right as a sovereign state is measured by a need for such water equal to that of Colorado, and is not determined by any limited use heretofore made which has been imposed upon Kansas water users through Colorado's wrongful depletion.

(9) That the water supply of the Arkansas River is now almost completely controlled in Colorado through the use of reservoirs heretofore constructed and by the Caddoa reservoir now in the process of completion, so that from this time forward practically no water will be able to pass into Kansas except such as is adjudicated to Kansas as her right by a decree of this court.

(10) That Kansas can be protected in the enjoyment of benefits from the flow of the Arkansas River and the development of irrigation enterprise which she is rightfully entitled to enjoy only by a decree which adjudicates to Kansas her equitable share of the flow of the river in

such terms and under such conditions as will compel delivery at the state line of such flow in amount and continuity as bears an equitable relationship to her needs and her rights.

Respectfully submitted,

A. B. MITCHELL,
Attorney General of Kansas,
Topeka, Kansas,

ELDON WALLINGFORD,
Assistant Attorney General,
Topeka, Kansas,

W. E. STANLEY,
First National Bank Building,
Wichita, Kansas,
Attorneys for the State of Kansas.

W. E. STANLEY,
Attorney for the Finney County Water Users' Association, a Corporation.

20-497

No. 5 Original

In the Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

REPLY BRIEF FOR DEFENDANTS

A. B. MITCHELL,
Attorney General of Kansas,
Topeka, Kansas,
ELDON WALLINGFORD,
Assistant Attorney General,
Topeka, Kansas,
W. E. STANLEY,
First National Bank Building,
Wichita, Kansas,
Attorneys for the State of Kansas.

W. E. STANLEY,
Attorney for The Finney County Water Users' Association, a Corporation.

20-864

INDEX

		PAGE
REPLY BRIEF FOR DEFENDANTS		5
I.	Preliminary Statement	5
II.	Contention of Colorado that any apportionment of the waters of an interstate stream which requires the placing of a restriction upon an upper state, and hence amounts to an impairment of the quasi-sovereignty of that state, has been repeatedly denied by this court	8
III.	The contention of Colorado that the decision of this court in Kansas v. Colorado made an equitable apportionment between the states of the waters of the Arkansas river is unsound	13
IV.	Colorado's exception to the finding of the master that the average annual natural flow of the river and its tributaries is 1,240,000 acre-feet, and that the average annual dependable water supply of the Arkansas river and its tributaries is 1,110,000 acre-feet is without substance	28
V.	Colorado's method of dealing with the problem of equitable apportionment of the water supply through the use of mass averages without reference to daily flows does not present an accurate picture, and such method has been disapproved by this court	34
VI.	Colorado's contention that there has been no material increase in the depletion of the Arkansas river since the decision in Kansas v. Colorado is contrary to all the evidence accepted by the master as having probative value on this subject	38
VII.	Colorado's argument that Kansas has suffered no damage by reason of Colorado water uses is predicated upon the erroneous assumption that since no right has been defined, or no water apportioned, Kansas has not been damaged	55
VIII.	The Stipulation of 1933	66
IX.	The So-called 1916 Settlement	72
X.	Colorado's contention that the master's recommended apportionment would result in the taking of water from established Colorado uses seeks merely to preserve a condition which the master has found to be inequitable and a present invasion of Kansas rights	73

PAGE

XI. Elimination of wasteful practices in Colorado would benefit irrigation therein as well as satisfy the master's equitable apportionment 81
(a) The economical use of water 82
(b) Excessive and uneconomic use by Colorado 85
(c) Economical use in Kansas 94

XII. Colorado's objections to the plan of the master securing the delivery of the apportionment to Kansas, and determining the amount as it originates, through the use of index stations, are untenable 105

XIII. Flood Waters 117

XIV. The Solicitor General's Memorandum 118

XV. Conclusion 119

LIST OF AUTHORITIES CITED

CASES:

Bean v. Morris, 221 U. S. 485, 31 Sup. Ct. 703 9
Busey v. Gallagher, 87 U. S. 577, 22 L. Ed. 452 93
Connecticut v. Massachusetts, 282 U. S. 660, 669 17
Hardin v. Hardin, 26 S. D. 601, 129 N. W. 108 28
Hinderlider v. La Plata River and Cherry Creek Ditch Co., 304 U. S. 92, 58 Sup. Ct. 803, 807, 809 56
Hinderlider v. La Plata River and Cherry Creek Ditch Co., 304 U. S. 92, 102, 108, 58 Sup. Ct. 803 12
Hinderlider v. La Plata River and Cherry Creek Ditch Co., 304 U. S. 92, 58 Sup. Ct. Rep. 803, 807, 809 56
Hinderlider v. La Plata River, *supra* 100
Kansas v. Colorado, 206 U. S. 46, 27 Sup. Ct. 655 10
Kansas v. Colorado, *supra* 119
Missouri v. Chi., Burl. & Quincy R. R., 241 U. S. 533, 539, 540, 36 Sup. Ct. 715, 60 L. Ed. 1148 24
Missouri v. Chicago, B. & Q. R. R. Co., 241 U. S. 533, 36 Sup. Ct. 715, 717 24
Missouri v. Illinois, 200 U. S. 496, 521, 26 Sup. Ct. 270 16
Nebraska v. Wyoming, *et al.*, Orig. No. 9, 1942 Term (Now pending) 118
Nebraska v. Wyoming, *supra* 119
New Jersey v. New York, 283 U. S. 336, 51 Sup. Ct. 478, 479 11

PAGE

New Jersey v. New York, *supra* 82
New York v. New Jersey, 256 U. S. 296, 309, 41 Sup. Ct. 492, 496 16
North Dakota v. Minnesota, 263 U. S. 365, 374, 44 Sup. Ct. 138, 139 17
Packet Co. v. Sickles, 5 Wall. 580, 72 U. S. 550 26
Rickey Land & Cattle Co. v. Miller & Lux, 218 U. S. 258, 31 Sup. Ct. 11 9
Robinson v. American Car & Foundry Co., 142 Fed. 170 .. 27
Russell v. Place, 4 Otto 606, 610, 24 L. Ed. 214, 215 26
Russell v. Place, *supra*, p. 215 26
Vandalia R. Co. v. Schnull, 255 U. S. 113, 41 Sup. Ct. 324, 23
Weiland v. Pioneer Irrigation Co., 259 U. S. 498, 42 Sup. Ct. 568 9
Wisconsin v. Illinois, 278 U. S. 399, 73 L. Ed. 426 56
Wisconsin v. Illinois, *supra* 77
Wyoming v. Colorado, 259 U. S. 419, 42 Sup. Ct. Rep. 552, 560, 561 36
Wyoming v. Colorado, 259 U. S. 419, 42 Sup. Ct. Rep. 552, 66 L. Ed. 999, 1021 94
Wyoming v. Colorado, *supra* 109

AUTHORITIES:

27 Sup. Ct. 655, p. 666, 688 57
206 U. S. p. 106 22
206 U. S. p. 108 22
278 U. S. 367, 420 78

In the Supreme Court
of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a Corporation, *Defendants*.

No. 5 Original

REPLY BRIEF FOR DEFENDANTS

I. Preliminary Statement

Defendants' original brief related to their exceptions to the Master's report. They agreed with the basic findings and conclusions therein contained as correct. Defendants' exceptions only related to those changes in language which they deemed necessary to be made by this Court in order to preserve the true intent and purpose of the Master.

The Master apportioned to Kansas 185,000 acre-feet of the average annual dependable water supply. This

amount is some 80,000 acre-feet less than the average annual amount which has heretofore crossed the state line. The conclusion is inescapable that the Master by so doing intended to substitute a dependable smaller amount, in conformity with irrigation needs, for a larger amount which to a very considerable extent was unusable. Such being the case, Kansas made no exception to the apportionment of one-sixth to Kansas and five-sixths to Colorado.

Colorado, in its brief at page 3, makes the following statement:

> "All parties have excepted to the recommended plan of apportionment."

and at page 19 the statement appears:

> "On the third issue the Special Master attempted to make an equitable apportionment, and all parties have excepted to this phase of his report."

Both such statements are incorrect, as is clearly evidenced by the exceptions filed herein by Kansas. Kansas has neither excepted to the apportionment, nor to the plan of apportionment. As a matter of fact, the Master adopted generally a plan of apportionment proposed by Kansas, and any exception made by Kansas, to those paragraphs of the report embodying such plan,

were made for the sake of clarification, and only to prevent future disputes arising over the intent and purpose thereof.

In this reply defendants propose to discuss Colorado's brief and its exceptions to the Master's report. At the outset it appears that Colorado contends that no finding or conclusion of the Master's report is correct or supported by the evidence, and that the long and critical consideration of the evidence by the Master has produced nothing of value for this Court's retention. Such a sweeping repudiation of the report is its own condemnation. It indicates that behind the smoke screen of exceptions Colorado seeks to postpone any final determination of rights as between these two commonwealths, and thus gain for herself further time in which she may proceed with unrestricted appropriation of water without the limitations or restrictions of a binding decree.

II. Contention of Colorado That Any Apportionment of the Waters of an Interstate Stream Which Requires the Placing of a Restriction Upon an Upper State, and Hence Amounts to an Impairment of the Quasi-Sovereignty of That State, Has Been Repeatedly Denied by This Court.

At page 28 of its brief Colorado mentions that the gravamen of the Colorado complaint in this case is the protection against harassment of its water users and the maintenance and safe-guarding of its quasi-sovereign control over its administration of the waters flowing within its borders. At page 31 Colorado states, "In the 21 years which elapsed between this decision (*Kansas v. Colorado*) and the institution of the present suit by Colorado . . . . , it (Kansas) was content to stand by and let its citizens carry on guerilla warfare against the Colorado water users."

The history of this controversy indicates that the State of Colorado recognizes no right of Kansas, or of its water users, to any of the waters of the Arkansas River. In the original case of *Kansas v. Colorado*, Colorado's theory was that she had a right to use, unhindered, all of the waters of the stream. Although this Court in that case denied the soundness of this contention, the dismissal of the case without prejudice left the State of Colorado

free to increase her appropriations and use with resultant further depletions in stream flow, as found by the Special Master (Finding of Fact V). The harassment and guerilla warfare referred to by Colorado was merely the institution by Kansas water users of suits seeking a recognition of their application to beneficial use of the waters of the Arkansas River at a time considerably prior to the application of water by many of the main Colorado ditches for similar uses. These cases were instituted on the basis of declarations of this Court. The cases of *Rickey Land & Cattle Co. v. Miller & Lux*, 218 U. S. 258, 31 Sup. Ct. 11; *Bean v. Morris*, 221 U. S. 485, 31 Sup. Ct. 703; and *Weiland v. Pioneer Irrigation Co.*, 259 U. S. 498, 42 Sup. Ct. 568, were sound precedents for the recognition of earlier priorities of ditches in a lower state against later priorities in an upper state.

When the defendant The Finney County Water Users' Association, acting upon the authority of these cases, instituted its action against Colorado ditches, Colorado remained silent. Each year consumed in the taking of the voluminous evidence was a year gained for Colorado in the increase of her irrigated acreage and the unrestricted appropriation of the water supply. When, however, the motions to dismiss in those cases were over-

ruled, and the possibility of some adjudication appeared imminent, Colorado then instituted this action, based upon the contention that private interests could not adjudicate such rights, but that the action was solely one between two sovereign states. Now again, after fifteen years consumed in the taking of evidence, we find Colorado seeking for a further delay and a postponement of apportionment by a reversion to her position taken thirty years ago and denied by this Court.

Colorado excepts to the determination and recommendation of the Master that an equitable apportionment of the water supply and flow of the Arkansas River and its tributaries between the State of Colorado and the State of Kansas should be made by stating, "any apportionment of the waters of an interstate stream requires the placing of a limitation or restriction on the upper state—in this case, Complainant, State of Colorado, and hence amounts to an impairment of the quasi-sovereignty of that state to the extent of such restriction or limitation" (Complainant's Exception I [a]). This contention has been denied by this Court repeatedly.

In *Kansas v. Colorado*, 206 U. S. 46, 27 Sup. Ct. 655, the principle of equitable apportionment of benefits between two states resulting from the flow of the river was first announced by this Court.

This rule was again recognized in the case of *Wyoming v. Colorado*, 259 U. S. 419, 42 Sup. Ct. 552, this Court, stating at page 564:

> "The upper state on such a stream does not have such ownership or control of the waters flowing therein as entitles her to divert and use them regardless of any injury or prejudice to the rights of the lower state in the stream."

and at page 566 this Court expressly denied the contention of Colorado which is here again raised by the following language:

> "The contention of Colorado that she as a state rightfully may divert and use as she may choose the waters flowing within her boundaries in this interstate stream, regardless of any prejudice that this may work to others having rights in the stream below her borders, cannot be maintained. The River throughout its course in both states is but a single stream, wherein each state has an interest which should be respected by the other."

This same principle again finds expression in the case of *New Jersey v. New York*, 283 U. S. 336, 51 Sup. Ct. 478, at page 479, where the Court states:

> ". . . A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it. . . . Both states have real and substantial interests in the River that must be reconciled as best they may. The different traditions and practices

> in different parts of the country may lead to varying results but the effort always is to secure an equitable apportionment without quibbling over formulas."

And recently in *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U. S. 92, 58 Sup. Ct. 803, at page 807, this Court states:

> "The claim that on interstate streams the upper state has such ownership or control of the whole stream as entitles it to divert all the water, regardless of any injury or prejudice to the lower state, has been made by Colorado in litigation concerning other interstate streams, but has been consistently denied by this Court."

and at page 809 this Court states:

> "Whether the apportionment of the waters of an interstate stream be made by compact between the upper and lower states with the consent of Congress or by a decree of this Court, the apportionment is binding upon the citizens of each state, and all water claimants, even where the state had granted the water rights before it entered into the compact."

Defendants therefore assume without further discussion here that Colorado's exception to the Master's finding, namely that she should be subject to no limitation or restraint in the use of water, will be recognized as merely a reiteration of a contention which Colorado and

her water users still maintain, in spite of the repeated pronouncements of this Court to the contrary. This Court will further recognize that this refusal of Colorado to accept the repeated declarations of this Court respecting equitable apportionment is the basic and fundamental reason for her sweeping repudiation of the entire report of the Special Master, and is the reason why no constructive suggestions have been offered in these exceptions which look to an adjustment of this controversy. All Colorado seeks is a further postponement of the final determination of this long controversy.

III. The Contention of Colorado That the Decision of This Court in Kansas v. Colorado Made an Equitable Apportionment Between the States of the Waters of the Arkansas River is Unsound.

At page 19 of complainant's brief is the following statement:

> "The three main issues presented by the pleadings are:
>
> "(1) Is Colorado entitled to an injunction against the further prosecution in a lower federal court of the cases brought by a Kansas water user against Colorado water users?
>
> "(2) Has Colorado destroyed or threatened to destroy the equitable apportionment of the benefits from the flow of the stream which this Court

by its decision in *Kansas v. Colorado* found had not been impaired by Colorado at that time?

"(3) If the answer to (2) is in the affirmative, what is an equitable apportionment between the states?"

With the first of these issues, as defined, Kansas is not in disagreement. The second is incorrect. It is assumed therein that this Court has prior to this case made an equitable apportionment of the waters of the River. That it has not done so will be more clearly pointed out in the discussion which follows. With the third issue, namely, "What is an equitable apportionment between the states?" we agree.

The second alleged issue, as framed by Colorado, presents an entirely contradictory position to her contention that there should be no limits imposed upon an upper state which impairs its quasi-sovereignty, by arguing that this has already been done and that this Court in the case of *Kansas v. Colorado* made an equitable apportionment between the states of the waters of the Arkansas. The Master expressly repudiated this contention, vigorously urged before him, that the effect of the Kansas-Colorado case amounted to an apportionment of the waters of the Arkansas River. Instead he found that equitable apportionment as between the two

states should be made in this case, and thereafter proceeded to make such apportionment as on the basis of the evidence to him seemed proper.

Because much of Colorado's brief is consumed in references to the former case, defendants feel called upon to review the issues presented by that case and show that no apportionment was or could have been made under the issues framed therein. In the case of *Kansas v. Colorado*, Kansas sought an injunction to restrain Colorado from diverting or using any of the waters of the Arkansas River, claiming a right to have the waters of that stream flow into Kansas undiminished under the common law riparian doctrine. Colorado claimed the complete ownership of the entire water supply of the stream, and the right of diversion and use, even to complete exhaustion of stream flow. The sole question raised by the issues was whether Kansas was entitled to an injunction which would completely restrain Colorado from the use of any waters for irrigation purposes from the stream. Kansas failed to maintain this issue, and this Court dismissed the case without prejudice upon terms which we shall hereafter discuss. In deciding the two diametrically opposed positions, this Court rejected both theories. It announced a new principle to be applied in determining the rights of

sovereign states with respect to the waters of an interstate stream. It there for the first time laid down the principle of equitable division of the benefits arising from the flow of an interstate stream. This case was a pioneer in this field of law, and has been so referred to by all writers on the subject. The principle there laid down became subsequently the basis for adjudication of interstate water disputes.

The reluctance of the court to exercise its extraordinary powers in a controversy between two sovereign states, unless the invasion of right is established by clear and convincing evidence is well known. In *Missouri v. Illinois*, 200 U. S. 496, 521, 26 Sup. Ct. 270, it was said:

> "Before this court ought to intervene, the case should be of serious magnitude, clearly and fully proved, and the principle to be applied should be one which the court is prepared deliberately to maintain against all considerations on the other side."

In *New York v. New Jersey*, 256 U. S. 296, 309, 41 Sup. Ct. 492, 496, is this expression of the rule:

> "Before this court can be moved to exercise its extraordinary power under the Constitution to control the conduct of one state at the suit of another, the threatened invasion of rights must be of serious magnitude and it must be established by clear and convincing evidence."

Likewise, this Court has announced that in such suits between states the burden resting upon the complainant state of proving its case is much greater than in an ordinary suit between parties. It was said in *North Dakota v. Minnesota*, 263 U. S. 365, 374, 44 Sup. Ct. 138, 139:

> "In such action by one state against another the burden on the complainant state of sustaining the allegations of its complaint is much greater than that imposed upon the complainant in an ordinary suit between private parties."

Likewise in *Connecticut v. Massachusetts*, 282 U. S. 660, at page 669 it was said:

> "The burden on Connecticut to sustain the allegations on which it seeks to prevent Massachusetts from making the proposed diversions is much greater than that generally required to be borne by one seeking an injunction in a suit between private parties."

Under such declarations, is it to be assumed that the adjudication of this Court was more than a final determination that the State of Kansas could not claim an unqualified right to the uninterrupted flow of the Arkansas River? Is it to be assumed that this Court would declare for the first time a principle of law which for the

future was to be the yardstick by which the rights of sovereign states in and to the waters of an interstate stream were to be determined, and then proceed in the same case to adjudicate rights thereunder when such relief was not a claim or issue in the cause, and with respect to which no evidence was adduced? We think not.

The cause of action in the old case was to enjoin a trespass or a continuing nuisance. No proof relating to equitable apportionment could have been introduced as a part of the old case. The issue raised by both states was diametrically opposed to that theory. The issue of equitable apportionment has never before this case been pleaded in any action between these two states.

If this Court had dismissed with prejudice the action of the State of Kansas, no one would have claimed that the extent and scope of the adjudication under the issues as drawn had adjudicated anything more than that the State of Kansas could not thereafter make a claim to the uninterrupted flow of the waters of the Arkansas River into Kansas.

How much less in reason is there to recommend the binding effect of a decree of dismissal without prejudice.

such as was in fact entered. The decree entered so far as it relates to the bill of complaint is as follows:

> "It is further ordered, adjudged and decreed by the Court that the bill of complaint be, and the same is hereby, dismissed as against all the defendants, without prejudice to the right of the complainant to institute new proceedings whenever it shall appear that through a material increase in the depletion of the waters of the Arkansas River by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two States resulting from the flow of the river."

There is nothing in this decree that adjudicates the respective rights of the two states. There was no factual declaration of any finding by the court which equitably apportioned the benefits or the flow of the stream as between the two states. Definition and delineation of the respective rights of each state was left for determination to a future action when the power of the court should be invoked to specifically define the rights of the two states in the water supply of the stream under issues drawn pursuant to the principle of law announced there for the first time. In *Kansas v. Colorado*, supra, *the character of the right was announced. The definition of the extent of that right was left open to future action in*

a case where that fact could be made the issue and evidence introduced in support thereof.

By the foregoing decree this Court recognized that in the future further depletion, changed conditions, and facts not then apparent from the record or from evidence not necessarily proper under the issues then drawn, the day would come when Kansas would request and be entitled to a determination of the equitable apportionment of the waters, and to abide that time the entire matter of equitable apportionment was left open for future determination. Was the quantum of water supply or a division thereof a matter of evidence in the early case? It was not. There were not in existence records from which a determination of total water supply could have even estimated. The evidence even tended to show that the then existing Colorado diversion would through seepage and return flow make an appreciable and important addition to the supply of water in the stream, and, as Mr. Carpenter testified (Tr. 664), the prospects for irrigating in Western Kansas depends upon the storing of water in Colorado—the greater the storage, the greater will be the area irrigated in Kansas. Was the question of the rights resulting from the early application to beneficial use of water by the Kansas ditches a matter in issue?

It was not. Kansas claimed the right to all the flow, undiminished; and this only was denied. Apparently Colorado, in support of its contention that it was entitled to deplete the water of the River, even to complete exhaustion, claimed that agriculture was an impossibility in Colorado without irrigation, and this Court mentioned in its opinion with respect to these areas that "they would have continued barren and unoccupied" except for irrigation. This contention has, as the evidence here shows, been proved to be utterly untenable.

There were no findings of fact in the decree, which defined or determined the respective rights of both states and which would be mutually binding on both Kansas and Colorado. The unsatisfactory character of the evidence was indicated by the Court in its opinion. The court indicated that it was not clear what surplus water, if any, comes out of the tributaries. It stated that it could not ascertain the amount of seepage and return flow. The court did not find the amount of water Colorado was using. The court did not find the quantum of water Colorado was equitably entitled to, nor did it find the amount of water Kansas was equitably entitled to. Moreover, and most important, it had no knowledge or infor-

mation as to the total quantity of water available for division.

The court, after referring to the voluminous amount of testimony, remarked:

> "We have endeavored to deduce from this volume those matters which seem most clearly proved, and must, as to other matters, be content to generalize and state what seems to be the tendency of the evidence." (206 U. S., page 106.)

and later after discussing value of development to Colorado:

> "That this development is largely owing to irrigation is something of which, from a consideration of the testimony, there can be no reasonable doubt. It has been a prime factor in securing this result, and before, at the instance of a sister state, this effective cause of Colorado's development is destroyed or materially interfered with, it should be clear that such sister state has not *merely some technical right, but also a right with a corresponding benefit.*" (206 U. S., page 108.)

By this later language it in substance said that the issue raised by Kansas, that it was entitled to all the flow, was a claim of merely a technical right. In the present case the issue before the Master is the right of Kansas *based on equality of need* and a right to equality of benefits.

Not only does sound reason and logic support the conclusion that the decree dismissing the case without prejudice left open for future determination the entire question of equitable apportionment, but this is supported by the interpretation of this class of decrees by the Supreme Court of the United States and by other courts.

The case of *Vandalia R. Co. v. Schnull*, 255 U. S. 113, 41 Sup. Ct. 324, was a suit against a railway company to restrain it from charging or receiving any other compensation than that mentioned and described in a certain order of the railroad commission. One defense urged was that a previous case decided by the Supreme Court of the United States was *res adjudicata*.

> "The final contention of defendants in error is that *Wood v. Vandalia Railroad Co.*, 231 U. S. 1, 34 Sup. Ct. 7, 58 L. Ed. 97, is *res adjudicata* of the issues in this case. The suit was by the Railroad Company to restrain the order of the Commission involved in the present litigation, and the ground of attack was, as it is here, that the rates ordered were not compensatory of the service to which they applied. The averments of the bill we held unsustained by the proofs and nothing more was decided. The judgment was not that the order of the Commission was valid but that it was not shown by the bill to be invalid, and the bill was dismissed without prejudice. That is, without preclusion of the right to show it invalid when attempted to be enforced at a subsequent period.

Missouri v. Chi., Burl. & Quincy R. R., 241 U. S. 533, 539, 540, 36 Sup. Ct. 715, 60 L. Ed. 1148. We cannot therefore yield to the contention."

Likewise in the Kansas-Colorado case there was no affirmative decree entered adjudicating and defining an equitable division of the waters of the Arkansas River. This Court evidently did not feel that under the issues and proof it was called upon to exercise its powers to the extent of entering an affirmative decree apportioning the waters of the stream as between the two states. It therefore dismissed the case without prejudice, recognizing that the time would come when in a proper proceeding it would be required to define the extent of the right of each state in and to the waters of the Arkansas River.

In the case of *Missouri v. Chicago B. & Q. R. Co.*, 241 U. S. 533, 36 Sup. Ct. 715, at page 717 the court said:

> "In other words, the decree enjoining the enforcement of the statute in that case was also qualified as without prejudice to the enforcement of the statute in the future if a change in conditions arose. The doctrine in the first aspect nowhere finds a more lucid statement than the one made on behalf of the court by Mr. Justice Moody in *Knoxville v. Knoxville Water Co.*, 212 U. S. 1, 53 L. Ed. 371, 29 Sup. Ct. Rep. 148. It has since been repeatedly applied in language which, in the completest way, makes the meaning of the limitation 'without prejudice' in such a case clear, and

leaves no ground for any dispute whatever on the subject. *Willcox v. Consolidated Gas Co.*, 212 U. S. 19, 53 L. Ed. 382, 48 L. R. A., n. s., 1134, 29 Sup. Ct. Rep. 192, 15 Ann. Cas. 1034; *Northern P. R. Co. v. North Dakota*, 216 U. S. 579, 54 L. Ed. 624, 30 Sup. Ct. Rep. 423; *Louisville v. Cumberland Teleph. & Teleg. Co.*, 225 U. S. 430, 56 L. Ed. 1151, 32 Sup. Ct. Rep. 741; *Missouri Rate Cases* (*Knott v. Chicago, B. & Q. R. Co.*), 230 U. S. 474, 57 L. Ed. 1571, 33 Sup. Ct. Rep. 975; *Des Moines Gas Co. v. Des Moines*, 238 U. S. 153, 59 L. Ed. 1244, P. U. R. 1915 D, 577, 35 Sup. Ct. Rep. 811. A complete illustration of the operation of the qualification is afforded by the North Dakota case, just cited, since in that case, as a result of the qualification 'without prejudice,' the case was subsequently reopened, and upon a consideration of new conditions arising in such future period, a different result followed from that which had been previously reached. 236 U. S. 585, 59 L. Ed. 735, L. R. A. ——, ——, P. U. R. 1915 C, 277, 35 Sup. Ct. Rep. 429, Ann. Cas. 1916 A, 1."

The decree referred to in the North Dakota case above cited was "Affirm the decree without prejudice to the right of the railroad company to reopen the case by appropriate proceedings, if after adequate trial it thinks it can prove more clearly than at present the confiscatory character of rates for coal." It will be noted that the decree referred to in the North Dakota case was affirmative in its character, definitely and finally determining

an actual issue involved in the case; while in *Kansas v. Colorado* no decree was entered which definitely adjudicated any right as between the two litigant states, the whole issue being completely left open for a future determination.

The case of *Russell v. Place*, 4 Otto 606, 610, 24 L. Ed. 214, was a suit for infringement of patent, where prior adjudication was pleaded. At page 215 the Court said, respecting the operation of the former judgment pleaded,

> "But to this operation of the judgment it must appear, either upon the face of the record or be shown by intrinsic evidence, that the precise question was raised and determined in the former suit. . . . the whole subject matter of the action will be at large, and open to a new contention, unless this uncertainty be removed by extrinsic evidence showing the precise point involved and determined. To apply the judgment, and give effect to the adjudication actually made, when the record leaves the matter in doubt, such evidence is admissible."

The court likewise said, quoting from *Packet Co. v. Sickles*, 5 Wall. 580, 72 U. S. 550, at page 215 of *Russell v. Place*:

> ". . . the general rule with respect to the conclusiveness of a verdict and judgment in a former suit between the same parties, when the judgment is used in pleading as an estoppel, or is

> relied upon as evidence, was stated to be substantially this: that, to render the judgment conclusive, it must appear by the record of the prior suit that the particular matter sought to be concluded was necessarily tried or determined; that is, that the verdict in the suit could not have been rendered without deciding that matter; or it must be shown by extrinsic evidence, consistent with the record, that the verdict and judgment necessarily involved the consideration and determination of the matter."

The case of *Robinson v. American Car & Foundry Co.*, 142 Fed. 170, was a suit brought for infringement of patent. The decree dismissed the bill for want of equity on the ground that no infringement was shown. The dismissal was without prejudice. The court stated at page 71:

> "As to the estoppel, the court in the first case dismissed the bill without prejudice. This was done for the express purpose of permitting further litigation of the same questions. This being so, neither party can plead the decree as an adjudication, or use it as evidence of estoppel. Estoppels are mutual; if one party is not bound the other cannot be. Hence the argument of plaintiff's attorney that the decree in the first case sustained the validity of the patent cannot be considered. A judgment or decree without prejudice never works estoppel or adjudicates the res."

In the present case the most that can be said for Colorado's contention is that it is attempting to raise an

estoppel without any mutuality, for if the contention of Colorado is carried to its logical conclusion it would be binding upon Kansas, but not binding upon Colorado. Otherwise, Colorado's equitable apportionment of the water supply would be limited purely to that quantum of water necessary to irrigate the 300,115 acres of land which was the amount this Court found Colorado had under irrigation.

In Hardin v. Hardin, 26 S. D. 601, 129 N. W. 108, the court stated:

> "Reservation of right to bring a second action preserves plaintiff's right to prove his cause of action by any competent evidence, although it is identical with that in the first action."

IV. Colorado's Exception to the Finding of the Master That the Average Annual Natural Flow of the River and its Tributaries is 1,240,000 Acre-Feet, and That the Average Annual Dependable Water Supply of the Arkansas River and its Tributaries is 1,110,000 Acre-Feet is Without Substance.

Complainant says that the Master's findings respecting the water supply of the basin are based upon estimates (Complainant's Exception IV-a), and that they cannot constitute any basis for a workable apportionment between the two states (Complainant's Exception IV-e).

Such statements are an effort to avoid the full force and effect of the voluminous water supply testimony which appears in the record at R. 1442 to 1519, Kansas Exhibits 18 to 62 inclusive, covering a 36-year period.

This determination of water supply, which was accepted by the Master, was prepared by the same modern engineering methods whereby the water supply of many of our streams throughout the West have been ascertained for the purposes of apportionment, irrigation uses, and interstate compacts relating to the division of waters of interstate streams. It was based upon the published records from the office of the state engineer of the State of Colorado. It was based upon daily records of river flow, ditch diversions, and other data published by the Arkansas Valley Ditch Association covering a period of more than twenty years. It is the only complete water supply analysis of the Arkansas River basin in Colorado which appears in the record.

The witness whose testimony was accepted by the Master as determinative of the question of water supply was Witness R. I. Meeker, an outstanding irrigation engineer who had been familiar with the River basin for over thirty years. His activity started an an engineer in the Arkansas River basin on the Twin Lakes Reservoir in

1899 and 1900, continued as a hydrographer for the United States Geological Survey on the Arkansas River from 1903 to 1907 (R. 1349), and this was followed by specialized activity on interstate water problems relating to the Laramie, the Rio Grande, the North Platte, Colorado, La Plata, Canadian, and the Arkansas River (R. 1346). The results of his investigational work upon the Laramie River appeared in the case of Wyoming v. Colorado in this Court. From 1919 until 1928 he was Special Deputy State Engineer for Colorado on interstate river litigation and interstate river compact negotiations (R. 1347) relating to the Colorado, La Plata, Arkansas, North Platte and Rio Grande Rivers (R. 1352). He has determined the total water supply of the following river basins, the Colorado River to Yuma, Arizona, the Rio Grande River to Ft. Quitman, Texas, the North Platte to Kearney, Nebraska, the South Platte to the Colorado-Nebraska line, the Arkansas to the 99th Meridian, the Canadian to the 99th Meridian, and the Green River to the Wyoming-Utah line (R. 1352).

In dealing with the Arkansas River water supply his determinations were made by two different methods, one of which was made to check the other. The first method used was by working down from the mountains, using the

records of river flow at Canon City, plus the records of mountain tributaries, plus computed inflows from unmeasured mountain areas, and deducing plains runoff from analytical studies of river inflow between Canon City and Holly for the nineteen-year period from 1912 to 1930 inclusive (Kansas Exhibits 18 to 75, inclusive). In this method the River was divided into sections, and the study made upon a daily basis where daily precipitation records could be examined with respect to influence upon river flow. By this method the amount arrived at as the average annual water supply was 1,290,000 acre feet (Kansas Exh. 55). The second determination, used as a check on the first, was the reconstruction of the Arkansas River flow from the Colorado area, using measured outflows at Holly (4 miles west of the Colorado-Kansas line), plus yearly water consumption by Colorado irrigated lands (Kansas Exhs. 36 to 62, inclusive). The amount arrived at by this method was 1,240,000 acre-feet as the average annual water supply for a 36-year period, and this latter figure was the amount accepted by the Master.

As a matter of fact, the Master no doubt ascertained from the record that, in spite of the fact that Colorado submitted no basin water supply study, Colorado's Wit-

ness Patterson was in substantial agreement with Meeker. At page 3693 of the record the testimony of Witness Patterson shows that he is in substantial agreement as to the water supply of the stream from Canon City to the state line, but that he, Patterson, did not add any estimated or assumed values of tributary consumption because "I did not feel that such values could be treated as a part of the river water supply."

Since, as shown by Kansas' original brief at page 121, some 195,000 acres of land utilizing the water supply are irrigated on the tributaries, if such water supply consumed in irrigating such land, which obviously is a part of the basin water supply, is included, then Colorado's witness is in substantial agreement with the Kansas testimony as to what constituted the entire basin water supply, and the Master's finding of 1,240,000 acre-foot as the average annual water supply was substantiated by both Colorado's and Kansas' testimony. The Master must necessarily have concluded—(*a*) that the tributaries are a part of the Arkansas River basin in Colorado; (*b*) that the water consumed on the tributaries by irrigation is a part of the basin water supply; (*c*) that the acreage irrigated on the tributaries from the water supply of the Arkansas River basin is a part of the benefit to Colorado

resulting from such water supply; and (*d*) that if to Mr. Patterson's figure of the water supply from Canon City to the state line were added the 300,000 acre-feet of water consumed on the tributaries by irrigation uses, his finding was supported by the testimony introduced by both states.

Colorado states, at page 62 of its brief:

> "Under no theory of equity and justice can Kansas . . . water users along the main stream require that such uses on the tributaries be limited or restricted in any way."

and again on the same page:

> "To use the entire basin water supply in Colorado as a basis for determining interstate rights is to apply an unsound formula to arrive at a ridiculous result."

By what processes of reasoning such statements are made is beyond the comprehension of defendants. By such statements one would assume that Colorado believed that the water supply available for use sprang up from within the channel of the main stream, rather than that it represented the mass total of the contribution of all of the tributaries making up such stream. If water supply means anything, it means all the water supply available for irrigation uses; and if benefits derived by Colorado

through irrigation uses means anything, it must include all of the irrigated area within the basin which operates to deplete and consume such water supply, particularly since some of Colorado's choicest irrigated areas exist along the tributaries. Common sense dictates that if tributary water supply was not so used to enhance Colorado benefits, the same would necessarily pass down the tributaries into the main stream, and thence across the state line into Kansas.

We therefore unhesitatingly state that the record compels the finding of the Master which was made respecting both the average annual water supply and the average annual dependable water supply of the basin.

V. Colorado's Method of Dealing With the Problem of Equitable Apportionment of the Water Supply Through the Use of Mass Averages Without Reference to Daily Flows Does Not Present an Accurate Picture, and Such Method Has Been Disapproved by This Court.

The factual development of Colorado's brief is largely confined to the conclusions of Witness Patterson, with a few minor exceptions, and the water statistics for the most part show averages on a seasonal or annual basis, with a complete avoidance of *basin water supply or daily river flows.*

Since we are dealing in this case with the problem of equitable apportionment of the water supply through the utility of stream flow for irrigation uses, intelligent and fair appraisement of that problem must of necessity be dependent upon the quantum of the total available water supply of the basin, and the character of river flow crossing the state line into Kansas on a daily basis. Crops can only be produced through a continuity of flow day by day, and not through average seasonal flows, which largely result from flash floods, or which do not pass down the river in such form or at such times as to be available for crop needs.

The Master clearly recognized that water for irrigation use was the main consideration in this case, and that the flow of the stream day by day furnished practically the sole criterion of its continuity and dependability for irrigation purposes. The use of acre feet quantities annually, seasonally, or sometimes by months, and averages covering a period of years where excessive flows are included, focusing attention on bulk quantities of water only, and thus diverting attention and consideration from the real and fundamental question of the actual dependable stream flow day by day, from which irrigation requirements must be met, gives the Court an inaccurate pres-

entation of the true picture. This is the method employed throughout Colorado's brief, and is the same method employed by Colorado in the case of *Wyoming v. Colorado*, 259 U. S. 419, 42 Sup. Ct. Rep. 552, which method was referred to by Mr. Justice Van Devanter at page 560 of the opinion in the following language:

> "Colorado's evidence, which for convenience we take up first, is directed to showing the average yearly flow of all years in a considerable period, *as if that constituted a proper measure* of the available supply. We think it is not a proper measure, and this because of the great variation in the flow. To be available in a practical sense the supply must be fairly continuous and dependable."

The court further states, at page 561:

> "We have dealt with the matter of average flow at this length because throughout Colorado's evidence and in her brief it is treated as if it were a proper measure of the supply available for practical use. It is there applied to the Laramie not only directly but indirectly by increasing the gauged flow for a particular year or period by percentages derived by comparing the flow of the Poudre for that year or period with the average for the 30 years including those in which the flow was so extraordinary that concededly much of it neither was or could be used. Thus, water which is not a part of the available supply is counted in measuring that supply."

Mr. Justice Van Devanter might well have been considering Colorado's evidence and brief in this case.

This answer brief would be entirely too voluminous if defendants were to attempt to point out in detail all of the errors lurking behind the mass of averages presented by Colorado, or all of the faulty conclusions which are attempted to be drawn therefrom. We here have only the space to point out a few which may serve as examples of the many which must be necessarily omitted. The Master, who had this same material presented to him, had ample opportunity to form his judgment with respect to the witness who prepared most of this material. The Master had many months in which to analyze the mass of statistics and determine their applicability to the true situation, and defendants must rely upon the skill and care with which he eliminated the nonessential facts from those having real probative value in this case, and from which he arrived at a correct determination of the basic and fundamental facts which the record discloses.

VI. Colorado's Contention That There Has Been no Material Increase in the Depletion of the Arkansas River Since the Decision in Kansas v. Colorado is Contrary to All the Evidence Accepted by the Master as Having Probative Value on This Subject.

Colorado in its brief excepts to the following finding of the Master:

> "There has been since the taking of the testimony in the case of *Kansas v. Colorado*, cited in 206 U. S. 46, in 1907, a material increase in the river depletion by Colorado of the water supply of the Arkansas River which has been consumed and used by Colorado users for irriagtion purposes." (Finding of Fact IX.)

From page 33 to page 43 of its brief, tables appear, containing only yearly and seasonal averages, the purpose of which is to support its contention that there has been no further depletion of the water supply since 1907. Most of these tables deal with a period from 1908 to 1938. The claimed reason for selecting this period was that it dealt with a sequence of years following the decision in the case of *Kansas v. Colorado*. The effect of the choice of these dates is to avoid consideration of a period of large water depletion, with respect to which this Court in the old case had no facts before it, and with re-

spect to which no decision of the Court could possibly apply.

As indicated by the opinion, records of flow at Canon City were not shown after 1900. The amount of acreage which the Court considered was expressly shown to be only 300,115 acres, as reported by the United States Census for the year 1902. Even though the decision in that case was not announced until May, 1907, it could certainly relate only to the factual information which the Court had before it for consideration. By 1909 Colorado had placed under irrigation in the Arkansas River basin 464,236 acres, or an additional burden of water consumption from 164,121 acres more than the Court considered. Thus, Colorado, in dealing in their brief with the period commencing as of 1908, in effect avoided any showing of the effect of irrigation on over 160,000 additional acres of land, which certainly depleted the waters of the basin to the extent of the water consumed thereon by irrigation. The omission of this critical period was, of course, apparent to the Master from his careful examination of the evidence.

The second defect, which renders unsound any conclusions drawn from the numerous tables submitted by Colorado in its effort to undermine the Master's finding

of depletion, is the complete avoidance therein of any reference to the basin water supply. It is a fact not subject to dispute that the amount of river depletion or water withdrawn for irrigation uses can be determined only by the difference between the actual water supply subject to irrigation use and the residual amount passing across the state line unconsumed.

For example, Kansas Exhibit 70, shown opposite page 76 of defendants' original brief, shows that the state line outflow in both 1906 and 1929 amounted to 260,000 acre-feet. Standing alone this matter easily could be accepted as an indication that there was no difference in water depletion in these two periods. However, if we turn to the essential fact of the water supply available, we find that in the 1906 period the basin water supply available for use amounted to only 990,000 acre-feet, so that a residual outflow of 260,000 acre-feet indicated a water consumption or depletion in Colorado amounting to 730,000 acre-feet. In the year 1929 we find that the water supply available for use amounted to 1,410,000 acre-feet, which with the residual outflow of 260,000 acre-feet indicated a water consumption or depletion by Colorado of 1,150,000 acre-feet, or an increase in depletion

of the water supply of 420,000 acre-feet more in the later period than in the earlier.

As hereinbefore stated, the State of Colorado from the beginning of this case has studiously avoided introducing any complete analysis of basin water supply, even though this fact was of primary importance in the determination of both the issues of apportionment and depletion. The only effort made by Colorado to produce any analysis of water supply related to only a small portion of the basin, namely, that of the river section between Pueblo and Holly, clearly omitting any reference to the water supply required to irrigate over 200,000 acres in the basin upon the tributaries and on the main stream above Pueblo. Such omission apparently did not mislead the Special Master.

The testimony of Colorado, produced by its main water engineer, Witness Tipton, relating to this limited area only, was most extensive, taking up over 800 pages and including over 60 exhibits. This water study of Colorado for this portion of the basin was set up in an attempt to minimize as far as possible the extent of Colorado's depletion of stream flow during the period from 1904 to 1932. It contained, however, glaring inconsistencies which were undoubtedly discovered by the Special Master from

his examination of the evidence. It omitted large quantities of the water supply of the River, so as to produce the absurd results in many instances, of minus quantities of tributary inflow, during periods when the Colorado stream flow records showed large quantities of tributary flow. Tipton stated in his testimony that he obtained tributary inflow in his computations by whatever was left after he *took out whatever he wanted to* for seepage and return flow and regulation waste (R. 4614).

A few instances of the errors in this testimony are illuminating. For the seven months' period October to April, inclusive, Tipton's study produced these interesting results. The tributary flow of 1911 for that period showed a minus quantity of 18,000 acre-feet (R. 4668). For 1925 Mr. Tipton's calculations resulted in a minus 6,000 acre-feet (R. 4669), and yet in that particular year the records in the State Engineer's office showed a contribution of 99,844 acre-feet from the Purgatoire (R. 4670), and 5,539 acre-feet from Wild Horse Creek (R. 4671), only two of the many tributaries contributing to the water supply of the river. For 1922 his figure for tributary inflow amounted to only 9,000 acre-feet; for 1912 a minus 2,000 acre-feet; for 1914, one of the years of the highest water supply in the Arkansas basin, a minus 11,000 acre-feet;

for the year 1927 a minus 23,000 acre-feet; and for the year 1928 zero acre-feet (R. 4677). Other years showed remarkably small amounts of tributary inflow for this period. During the period 1911 to 1932 Mr. Tipton's deductions for seepage, return flow, regulation waste, and reservoir exchange amounted to 4,630,000 acre-feet during the October to April period, with only 823,000 acre-feet of tributary inflow (R. 4678).

It is interesting to note that in Colorado's briefs to this Court it has discarded the testimony of its main witness relating to the water supply in the section between Pueblo and Holly, so effectively was this testimony discredited. This probably accounts for Colorado's avoidance of any question of basin water supply in any material presented in its brief to this Court.

At page 33 of Colorado's brief a table is submitted purporting to represent annual diversions, returns, and depletion from Pueblo to the state line for certain selected periods. Complainants attempt to show by comparing the period 1904 to 1911 with 1921 to 1930 that there was 55,000 acre-feet less depletion of the waters of the River in Colorado in the later period than in the earlier. Since the only true measure of depletion is the difference between the basin water supply and the amount unconsumed

which passes out as outflow, the method used by Colorado is erroneous and misleading, and cannot possibly reflect depletion. It is a fact which cannot be disputed that the diversions there used are only a partial list of the total diversions for irrigation in the Arkansas River basin in Colorado. Omitted therefrom are all of the diversions of water for irrigating over 200,000 acres of land upon the tributaries and upon the main stream above Pueblo in the rather productive Canon City area. It likewise fails to give consideration to the substantial water depletion resulting from water storage evaporation. The figures used in this tabulation do not include all of the water actually diverted to and used on the land, for as was pointed out by Witness Knapp, ditches supposedly recording diversions from the River in the Pueblo to Holly section intercepted large quantities of tributary water and applied the same before it ever reached the River (R. 5150). Thus, large quantities of water actually used and applied to the land are not shown as diversions by Colorado. Likewise, there is a failure to include in diversions water consumed by pumping from wells in this river section (R. 5150).

The true facts disclose an entirely different picture than the alleged 55,000 acre decline in depletion. While the

use of the eight-year period 1904 to 1911, contrasted with the ten-year period 1921 to 1930, obviously permitted the inclusion in the latter period of the year 1921, the year of the devastating Pueblo flood, and 1923, the wettest year on record, both of which were excluded in the determination of dependable water supply, the facts nevertheless are as follows: The average water supply 1904 to 1911 amounted to 1,210,000 acre-feet, and the state line outflow amounted to 381,000 acre-feet; and in the period 1921 to 1930 the average water supply amounted to 1,409,000 acre-feet, and the state line outflow amounted to 376,000 acre-feet (Kansas Exh. 70). Thus, in the later period, although the water supply was more abundant by 200,000 acre-feet, the outflow was 5,000 acre-feet less. So we see that, even though in the latter period there were included two abnormally high water years, when 960,000 acre-feet and 820,000 acre-feet, respectively, passed across the state line, we still find a depletion of approximately 205,000 acre-feet more water in the later period than in the earlier.

If we take the first five years, 1904 to 1908, and compare the depletion with the last five years 1926 to 1930, thus eliminating the abnormal years of 1921 and 1923, the facts are as follows: During the period 1904 to 1908

the average annual water supply of the basin amounted to 1,302,000 acre-feet, and the state line outflow amounted to 504,000 acre-feet; and in the period 1926 to 1930 the annual water supply of the basin amounted to 1,312,000 acre-feet, and the state line outflow amounted to 264,000 acre-feet (Kansas Exh. 70). Here, although the water supply was practically the same—only 10,000 acre-feet more in the recent period than in the earlier period—we find that 340,000 acre-feet less water passed across the state line than in the earlier period.

Again, if we use for illustration the period 1901 to 1905, which is the period from the time of the institution of the Kansas-Colorado case until the close of the taking of evidence, and compare it with the last five-year period 1926 to 1930 on which there is any water supply data for the basin, we find the following situation: The average annual water supply of the basin 1901 to 1905 amounted to 1,118,000 acre-feet, and the state line outflow amounted to 464,000 acre-feet. During the period 1926 to 1930 the total basin water supply amounted to 1,312,000 acre-feet, and the state line outflow amounted to only 264,000 acre-feet. Thus, from the period ending with the close of testimony in the old case to the latter period the extent of increased depletion amounted to approximately 394,000

acre-feet. A more extensive discussion of depletion appears in defendants' brief, pages 66 to 81, inclusive.

One fact, however, stands out in the record, which needs no irrigation engineer to support its conclusiveness. 257,957 additional acres of land were placed under irrigation in Colorado between 1902 and 1929 (Kansas Exh. 52, R. 1507). The permanent consumption of water utilized for the growing of crops on this increased acreage would unquestionably deplete the basin water supply to the extent of the water so used. The testimony of Witness Meeker shows that the additional consumption between 1907 and 1930 amounted to 300,000 acre-feet (R. 1565). Even Colorado's Witness Tipton admitted a net increase in water consumption by Colorado (R. 3223).

Refering to the table shown on page 39 of complainant's brief, purporting to indicate the increase in usable water for Kansas during this same period, 1908 to 1938, we find again a lack of any reference to, or a comparison with, the basin water supply shown in those respective years. However, this table is subject to an even greater criticism. To attempt to indicate usability of water merely on a basis of averages for an entire period, April to September, inclusive, and not upon a daily basis, is to eliminate from consideration completely the question of continuity of

flow, which is primary from the standpoint of irrigation use. For example, if we take the years 1918 with 19,000 acre-feet of usable flow, 1927 with 91,400 acre-feet of usable flow, and 1929 with 68,000 acre-feet of usable flow, and compare these amounts of so-called usable flow with the water supply in those respective years, we find that in the year 1927 there was 370,000 acre-feet greater basin water supply than in the year 1918, and in the year 1929, 270,000 acre-feet greater basin water supply than in 1918 (Reference, Kansas Exh. 70); but if we compare these with the picture of usability disclosed by the daily flows of the River, shown by the hydrographs appearing opposite page 90 of defendants' brief, we find that the so-called substantial usable flows for the years 1927 and 1929 resulted from floods which came about the 20th of July in 1927 and approximately the 8th day of August in 1929. It can be clearly observed from such reference that prior to those dates Kansas water users had practically no supply of any utility for crop production, and that by the latter part of July and the 1st of August all crops dependent upon irrigation water would have been destroyed because no usable supply was available. It takes no irrigation expert to realize that usable water, as indicated by Colorado's misleading use of averages, would be usable only for the purpose of seeing whether

the ditches would still hold water after the earlier months of disuse.

Space does not permit us to take up each year in detail and present the erroneous picture presented by the mass totals classified as usable water, but in this connection a reference to page 90 of Kansas' brief and to the tables appearing at pages 96 to 100, inclusive, would be most illuminating. Following is a table showing an analysis of the character of flow across the state line:

ANALYSIS OF FLOW OF WATER PASSING THE STATE LINE AS RECORDED IN SECOND-FOOT DAYS FOR THE APRIL TO SEPTEMBER PERIOD

Year	Total April to September Period	Total During Period of 15 Days Only	Total During Remaining 168 Days	Number of Days During Season When Flow was Below 100 S. F.
1908	22,665	15,635	7,030	122 below 100
1909	95,506	53,900	42,506	101 below 100
1910	39,063	26,595	12,468	133 below 100
1911	24,490	18,490	5,618	148 below 100
1912	67,547	45,695	21,852	100 below 100
1913	16,723	12,086	4,637	167 below 100
1914	263,212	114,090	149,122	80 below 100
1915	216,693	93,300	123,393	24 below 100
1916	35,266	26,620	8,646	131 below 100
1917	9,527	2,570	6,957	163 below 100
1918	13,258	4,855	8,403	145 below 100
1919	75,430	35,230	40,220	101 below 100
1920	59,575	29,130	30,445	104 below 100
1921	454,390	253,440	200,813	83 below 100
1922	18,145	9,280	8,865	131 below 100
1923	296,925	126,020	170,903	63 below 100
1924	44,756	18,053	26,703	118 below 100
1925	90,245	65,690	24,555	125 below 100
1926	20,117	10,585	9,532	130 below 100
1927	197,924	140,820	57,104	121 below 100
1928	94,235	63,640	30,595	125 below 100
1929	63,129	59,837	3,292	141 below 100
1930	26,288	12,699	13,589	122 below 100
1931	13,058	8,118	3,940	155 below 100
1932	10,244	7,292	2,952	166 below 100
1933	65,113	42,730	22,383	106 below 100
1934	12,667	10,600	2,067	172 below 100
1935	83,217	52,470	30,747	103 below 100
1936	154,743	119,240	35,503	124 below 100
1937	53,286	42,012	11,274	114 below 100
1938	81,042	44,270	36,772	99 below 100
1939	4,586	1,899	2,857	178 below 100
1940	6,973	4,435	2,973	165 below 100

In the table on page 39 of Colorado's brief there appear three years during the period 1930 to 1938 when the alleged usable supply exceeded 100,000 acre-feet. By making the statement, on page 40 of Colorado's brief, in substance; that the period 1931 to 1938 included eight drought years, there is an attempt to create an impression that even in a drought period the usable supply for Kansas had been increased. Since Colorado introduced no basin water supply data for this period, it probably felt safe in making the assertion respecting this being a drought period. The record, however, discloses sufficient facts, which the Master undoubtedly carefully analyzed, to indicate that far from being drought years the three years when Kansas' alleged usable supply exceeded 100,000 acre-feet were years of very abundant water supply. This is shown by the fact that the May to September, inclusive, Canon City flow for the year 1935 was 335,000 acre-feet, for the year 1936, 338,000 acre-feet, and for the year 1938 375,000 acre-feet. Since the long-time 53-year average of the Canon City flow for these months amounted to 322,536 acre-feet, this shows that these years were substantially higher than the average with respect to mountain water supply. If, in addition to this fact, one examines for those particular years the rainfall record on

the plains area, as submitted in Colorado's Exhibit 190, there are found months of exceedingly high precipitation which produced an abnormal condition so exceptional as to probably not again be duplicated for a period of twenty or thirty years. This had two effects.

First, abnormal rainfall in the main irrigated area, which probably provided sufficient moisture for crop development, and where the withdrawal of normal quantities from stream flow in addition, would result in damage to crops. For example, Rocky Ford, in the very heart of irrigation, had precipitation during the month of May for the three years, respectively, of 2.45, 2.95 and 2.43 inches as against a long time 42-year record of 1.98 inches. The month of July, 1936, showed a precipitation of 3.46 inches as against an average of 2.46 inches. The month of August for these three years showed 1.47, .78 and 2.07 inches, respectively, as against an average of 1.43 inches, while the month of September for these three years showed 1.90, 2.03 and 1.14 inches, respectively, as against the long-time average of 0.74 inches. At Ordway, around which is clustered some of the best irrigation projects, we find for the month of May in these years 2.30, 1.80 and 2.22 inches, respectively, against a long-time average of 1.99 inches. Eliminating other ex-

cessive months and passing to the months of September for these years at this station, we find 1.91, 1.72 and 2.37 inches, respectively, as against a long-time average of 0.66 inches. At Las Animas, slightly nearer the state line, for the month of May in these years we find 2.42, 4.59 and 3.22 inches, respectively, as against a 64-year average of 1.98 inches. For June of 1935 we find 3.53 inches, respectively, as against an average of 1.47 inches. For July of 1936 and 1938 we find 2.36 and 2.67 inches, respectively, as against an average of 2.21 inches. In September for the three years we find 2.19, 1.71 and 1.91 inches, respectively, as against an average of .95 inches. At Lamar, some 75 miles west of the state line, for the month of May in the three years we find 2.71, 4.45 and 4.37 inches, respectively, as against a 42-year average of 2.17 inches. At Holly, a few miles west of the state line, for the month of May in the three years we find 2.19, 3.13 and 3.76 inches, respectively, as against a long-time average of 1.97. The data given by no means constitutes the entire record of abnormal precipitation, but it serves to illustrate the reason why during these years large amounts of unused water passed across the state line into Kansas.

Second, abnormal precipitation on the watersheds of

the Big Sandy and Two Buttes Creek, which enter the Arkansas River just west of the state line, and which normally contribute little water to stream flow, caused under these conditions of abnormal precipitation, large quantities to pass across the state line. North of the River at Limon we find such precipitation figures as 5.29, 2.92, 3.26, 4.68, 2.49 and 2.57 inches, all far above the long-time average for similar months. Other stations north of the River reflect similar abnormal precipitation. Turning to the watershed of Two Buttes Creek at Springfield, we find the monthly precipitation as follows: 4.28, 3.35, 3.60, 2.70, 2.73 and 2.85 inches, again reflecting precipitation during these years far above the long-time average.

At page 42 of Colorado's brief appears another table, purporting to represent diversions from the Arkansas River by ditches in certain counties in Kansas. This brief would be entirely too protracted to continue as we have done to demonstrate the defects which are concealed by the use of averages. It is only necessary to state that there were no records of any kind or character kept prior to the year 1915 of ditch diversions in Kansas. Records were kept only from 1915 to 1922 of those periods when water for the Garden City group was being

rotated, because of the insufficient supply, thus complete figures for those years must be estimates. Only since 1922 are actual records available for the Garden City group of ditches. During the entire period no diversion records were available for the Syracuse group. Thus, any figures respecting diversions appearing prior to 1922 in Kansas are largely dependent upon the imagination of their author. Any conclusion drawn from such created data must on its face be inaccurate and unconclusive. We have this strange situation of tables presented, where for the earlier period there are no records of diversions, and where for the later period, 1931 to 1938, there are no figures respecting water supply.

In concluding the discussion upon this point defendants deem it necessary to direct attention to another statement made by Colorado which is plainly erroneous.

At page 37 of Colorado's brief is the statement:

> "The period 1895 to 1930 selected by the Kansas witness began just after the drought of 1888 to 1894 (Tr. p. 3424, 3485, Colo. Ex. 17, 18), and ends just before the recent drought of 1931 to 1940. Since major floods during the period are included in the annual totals and since by the period selected the droughts of major intensity and duration that immediately preceded and followed it are excluded, Colorado contends that the period averages are thereby distorted, constitute

> greater than normal values and do not properly represent the true conditions."

The true facts are, that for the years 1885 to 1894 records at Canon City show an average yearly flow of 592,400 acre-feet as contrasted with an average yearly flow of 484,000 acre-feet for the period 1895 to 1904 (Kan. Exhibit 18) and an average yearly flow of 595,000 acre-feet for the period 1895 to 1930. (Kan. Exhibit 25.)

VII. Colorado's Argument That Kansas Has Suffered no Damage by Reason of Colorado Water Uses is Predicated Upon the Erroneous Assumption That Since no Right Has Been Defined, or no Water Apportioned, Kansas Has Not Been Damaged.

Colorado takes exception to the finding of the Special Master that by reason of the water supply which has been consumed and used by Colorado users for irrigation purposes there have been injuries to the substantial interests of Kansas (see Finding of Fact Five). It argues in support thereof, at page 44:

> "There is no showing that any Kansas enterprise, irrigation, industrial, municipal, or otherwise, is in a worse condition now than at the time of the former case . . . ."

This argument is apparently predicated upon the erroneous assumption that because the extent of the right

to water for irrigation purposes from the Arkansas River has never been defined, Kansas is not in a position to prove damage.

If the State of Kansas, as the lower state upon an interstate stream, is entitled to an equitable apportionment of the flow of such stream, as this Court has heretofore declared, then the damage suffered by the lower state is necessarily dependent upon the extent to which the upper state has invaded or destroyed that right. To argue that Kansas has not been damaged, merely because the extent or quantum of the right has never been defined, hardly comports with the decisions of this Court made in the case of *Wisconsin v. Illinois*, 278 U. S. 399, 73 L. Ed. 426, where the Court had first to determine the rights of the complainant State of Wisconsin before it could determine the extent of the damage resulting from the withdrawals of water from Lake Michigan by the City of Chicago and the State of Illinois through the Chicago Drainage Canal. It likewise does not accord with the finding of this Court in *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U. S. 92, 58 Sup. Ct. Rep. 803, where at page 807 the Court states:

> "As the La Plata River flows from Colorado into New Mexico, and in each state the water is used

> beneficially, it must be equitably apportioned between the two."

and again, at page 809:

> "Whether the apportionment of the water of an interstate stream be made by compact between the upper and lower states with the consent of Congress or by a decree of this court, the apportionment is binding upon the citizens of each state and all water claimants, even where the state had granted the water rights before it entered into the compact."

Apparently this argument is also based on the fallacious theory that equitable apportionment may not result in any division of the water at all, but may allow one of the states all, or substantially all, of the waters of the stream as an off-set to other advantages of the opponent's position.

As the Court stated in the case of *Kansas v. Colorado*, with respect to the adjustment of the dispute on the basis of the equality of right, it was "to secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of the like beneficial effects of a flowing stream," (27 Sup. Ct. 655, at page 666.) Any destruction of like benefits must necessarily constitute damage, and these have been clearly shown by the record. This Court further states, at page 688:

> "It would not be a defense on the part of the upper riparian proprietor that by the use to which he had appropriated the water he had benefited the lower proprietor, or that the latter had received in any other respects an equivalent."

And yet much of Colorado's argument is based upon population statistics and agricultural production, showing substantial increases, which have resulted from causes entirely independent of the depletion of the water supply of the Arkansas River. The Master from his careful examination of the record undoubtedly felt that when ditches and laterals sufficient to irrigate some 400,000 acres of land where unable to be placed in operation because of a deprivation of water, the same constituted damage. The Master without doubt concluded that when only 22,428 acres in the three counties along the River in western Kansas remain that are still attempting to struggle with irrigation without having to resort to pumping from ground water supplies to make up the deficiencies in flow, that this indicated damage. The Master must surely have decided that the depletion of 300,000 acre-feet of water from the streamflow likewise constituted damage, and that moreover when during 1,905 days out of a total of 3,340 days in a 20-year period, less than 100

second-feet of flow was available for irrigation, that this fact constituted damage. (Kan. Brief, page 94.)

The facts above referred to, constitute the true measure of damage, and the statistical information, largely prepared by Colorado's Witness Patterson, on population, crop values, and assessed valuation appearing in Colorado's appendix B, practically all of which are developments taking place under natural conditions and resulted in spite of the deprivation of a water supply for irrigation, are wholly irrelevant to the issue in this case. It is interesting to observe in this connection that Colorado, at page 1 of its brief states: "The *controversy involves the use for irrigation purposes* of water of an interstate stream." (Emphasis added.)

However, because Colorado has seen fit to inject this type of material in support of its argument, some reference to Witness Patterson's approach to this phase of the testimony is necessary.

At page 3834 of the record Witness Patterson attempted to attribute the gain in population of the counties on the River to a more successful agriculture, and yet at R. 3826 Witness Patterson states that he had not investigated or made any effort to investigate or ascertain the actual rural population, or the population dependent purely upon

agriculture as distinguished from city population or industrial population, or the population which is dependent upon oil. At R. 2866 Witness Patterson stated:

> "If there had been some growth dependent upon stream flow, and if stream flow had been ther destroyed or removed, there would have been a reduction in the rates of gain to a point where the river counties would have shown lesser rates of gain than the comparable adjoining counties."

Witness Patterson finally admitted, at R. 3820, that the development of the river counties to a greater extent than the off-river counties is due to some other factors than stream flow conditions. He further admitted, at R. 3958, that the acreage of crops in Kansas is no indication of the development that might have taken place by irrigation.

Permit us here to point out in this respect that while Colorado through Witness Patterson produced rather elaborate compilations of agricultural data with respect to the acreage of field crops, the value of field crops, and the assessed valuations of agricultural lands, in most instances in connection with statistics relating to the State of Kansas, they did not introduce similar compilations for the Colorado area. For example, as to production of wheat in Kansas, 1881 to 1930 (Colorado Exh. 60), Patterson

testified that as between the decade of the 1880's as compared to the decade of the 1920's that Kansas showed a gain of approximately five times as compared to a substantial doubling of world wheat production (R. 2954). Like records for Colorado were not presented. Upon being asked whether the increase in Colorado was not still greater, and in fact had in the same period increased thirteen times (R. 3964), he replied that he had no records on which to base a conclusion (R. 3965). He was then handed Bulletin No. 91, "Agricultural Statistics, Crops and Livestock, of the State of Colorado, 1933," and cited to page 52, showing the acres, production and value of wheat in Colorado from 1880. He then admitted that the record showed that in 1880 there was only 68,000 acres of wheat in the State of Colorado, and that by 1930 the acreage had increased to 1,659,000 acres (R. 3966), an increase of 24 times.

Witness Patterson's second purpose in introducing this statistical information is disclosed by his statement, "In dividing benefits the total resources of the state should be considered" (R. 3712). It is noticeable that in the entire Colorado brief no comparisons of total Colorado resources are submitted. It would seem that, if the theory of counsel in introducing this evidence, is that equitable

apportionment of benefits should be determined upon a comparison of total state resources, that reference to such comparisons should at least have been made.

As to a number of tabulations in which acres of crops, yields and assessed valuations of agricultural lands where comparisons were made between both states, the unusual procedure was adopted of showing the figures in terms of yield or value per square mile. It is obvious to anyone familiar with both states that the purpose of this was to include in the Colorado statistics thousands of square miles of mountainous and timber country containing untold resources of minerals and timber which never were and never could be used for agriculture, but which nevertheless would minimize the true agricultural resources of Colorado. There was utterly no comparison made on the per-acre basis (R. 3988), although all of the statistics relating to Kansas were produced on a per-acre basis. When it came to a comparison of Kansas with Colorado, the square mile basis was used.

Witness Patterson stated that he made no effort to ascertain in counties in Kansas and Colorado the acreage undeveloped or the acreage of tillable land (R. 3989). He admitted that all grazing lands not suitable to farming operations, unpatented lands, and broken areas in

Colorado were lumped into the square mile basis (R. 3989). It is further interesting to note that in dealing with the matter of assessed valuation the assessed valuation figures which were produced respecting Kansas included the valuations of all farm improvements, as well as coal mines, zinc mines, mining equipment, brick plants, oil wells, oil refineries, stone quarries, mills, smelters, and many other factors. These were compared with assessed valuation figures in Colorado, limited to the assessed valuation of improved fruit land, irrigated land, natural hay land, dry farming land, and grazing land only, after having eliminated from Colorado's statistics values of suburban home property, all agricultural improvements and all timber land (R. 4017). There were no deductions of unpatented land or forest land in Colorado (R. 4027). It was claimed by Witness Patterson that he did not have the records for the five counties along the Arkansas river in Eastern Colorado showing how much of 7,654 square miles therein was subject to assessment (R. 4020), although subsequently (R. 4928) he did produce the figures showing that nearly 1,300 square miles in these five counties were unpatented lands. Mr. Patterson finally admitted (R. 4019) that he did not make an accurate comparison—"I think I was a little in

error." Yet this material is produced in Colorado's Appendix B without comment.

That all of his statistical information had little or no bearing on the fundamental issues in the case is best indicated by Patterson's own admissions. He admitted that the only means by which either of the parties to the controversy may derive benefit of water supply is through diversion in connection with agricultural operations (R. 3721). He admitted that if irrigation as distinguished from general agriculture is involved, then benefit to be derived from water supply is decreased in proportion as the opportunity for diversion is decreased (R. 3722). He admitted that curtailment of opportunity for diversion would result in curtailment of benefits derived therefrom (R. 3723). He admitted that in considering irrigated areas in Eastern Colorado and Western Kansas we should consider what would result to each in the absence of a supplemental water supply (R. 3724). That it probably can be answered best by study of relative success of dry farming operations (R. 3724). That the real answer must be the result in two comparable areas of dry farming, without resorting to irrigation (R. 3724). That comparison should be made in areas where the need for supplemental water is of paramount im-

portance (R. 3726). That unit yield discloses effectively the productivity of the land per acre under natural conditions. We determine what land will do by unit yield (R. 3748). He states further that the benefits under consideration are the increased yields and the increased profits to be derived from the use of water. (R. 3752). That the real question is the benefit to be derived from additional yields of high water crops that can be raised under irrigation (R. 3753).

And yet, admitting all this, he said he doesn't know of dry land comparisons between Kansas and Colorado (R. 3788); and that such comparisons between Western Kansas and Eastern Colorado would have been fine if they had had available Colorado statistics (R. 3780). He makes this statement as one of Colorado's main witnesses, even though such statistics were at all times available to him if he had cared to investigate the facts, and such facts are in this record, produced by Kansas, taken from published Kansas and Colorado agricultural statistics. (See Kansas' brief, pages 61, *et seq.*)

We suggest that all of Colorado's testimony here referred to is entirely irrelevant, and has no bearing upon the fundamental issue in this case; that the real issue

involved, as indicated by the decisions of this Court, is the equitable apportionment of the water supply of the Arkansas River in such manner as "to secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of the *like* beneficial effects of a flowing stream."

VIII. The Stipulation of 1933

Certain statements appear in complainant's brief with respect to the so-called stipulation of 1933. Before the Special Master the contention was made that this instrument had some binding effect upon the parties with respect to apportionment. This induced the Master, in Conclusion of Law Seven, to make the following conclusion:

> ". . . and the stipulation executed by certain officials, attorneys and engineers of the States of Colorado and Kansas purporting to represent said states is not binding upon either of said states, nor to be embodied in a decree in the present suit permanently adjudicating an equitable apportionment of the water supply of the Arkansas River and its tributaries between the two states." (Conclusion of Law Seven.)

While Colorado in its brief apparently recedes from its position that this stipulation has any binding effect as

an equitable apportionment, it does make the following statement, at page 94 of its brief:

> "Colorado says that the stipulation represents a method of allocation of water which all the parties thought to be equitable at the time of execution. Certainly it would not have been signed if the parties had not considered it fair and equitable."

It further states:

> "If the Kansas officials had thought for one moment that the stipulation did not contain a fair and proper allocation of water, they would not have signed it."

Such statements are incorrect. The stipulation speaks for itself. However, statements of this character seem to require answer, even though they have little to do with the decision in this case.

The facts with respect to the background of this instrument are as follows. Some time during the early stages of this case it became apparent that a dam and channel reservoir might be constructed upon the Arkansas River at the Caddoa site as a part of the flood control program of the United States Government. It was also recognized that with a channel reservoir surplus and unusable flood flows which had passed across the state line into Kansas in unusable form, and which could not

be stored because of the lack of feasible reservoir sites in Kansas, could be impounded in such a reservoir, thus conserving for irrigation use water which theretofore had little utility. It was also recognized that such stored waters to the extent of approximately 100,000 acre-feet or more would form a back-log, which upon release during the growing season would be able to supply at least a portion of the water which the Supreme Court might adjudicate to Kansas upon the final determination of the issues in the present case. At that time there was only a small part of the testimony in this case taken, approximately 14 volumes, and it appeared probable that the reservoir, if authorized, might be completed before this case could be submitted to the Supreme Court for final determination. Under such circumstances during the period between dam completion and the determination of equitable apportionment by this Court, the Kansas ditches would be cut off from most the small quantum of water which they were able to capture from these periodical flood flows.

Kansas counsel were therefore faced with the dilemma of either having to take steps to prevent the construction of a reservoir which would permit the furnishing of at least 100,000 acre-feet more of usable water to Kan-

sas during the growing season without in any way affecting Colorado uses, or else arrive at some temporary arrangement which would protect the Kansas existing meager supply between the period of the completion of the dam and the final determination of the question of equitable apportionment. Obviously there would be surplus stored water, and this was arbitrarily divided on a 50-50 basis as a pure temporary expedient. This was its sole purpose. It was intended to be temporary in character pending the determination of the rights of the respective states; it was in no sense intended to be indicative of those rights; and we believe that the stipulation itself shows clearly that these are the facts.

In the first whereas clause, the fact of the period of delay before final submission is recognized, by the language, "and the final submission of the case to the court and the entry of the decree will not be practicable to be reached for some time in the future."

The preservation of existing rights and the present uses is shown by the fourth whereas clause, where the stipulation states:

> "That the parties . . . are willing to cooperate in attempting to bring about such construction by the United States government if assured of the *protection* not only to *all rights which*

> *they now have and which are involved in the present controversy,* but also to their existing water supply in the event the dam should be constructed and put in operation prior to a decree being entered in the Supreme Court of the United States."

In Paragraph 2 the preservation of the status quo is recognized.

Paragraph 8 reads as follows:

> "This stipulation is without prejudice to the claims of either party hereto in the above entitled case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties hereto to water flowing in the Arkansas River or stored in said reservoir."

Such language speaks for itself, and indicates clearly that none of its provisions were to have effect on or relate to the determination of the fundamental issue in this case or to the determination of the respective rights of the two states.

The use which Colorado now makes of this stipulation, which was to preserve the status quo of ditches below the dam pending a determination by the Supreme Court of the United States, *i. e.*, by claiming it to be proof of what constitutes an equitable apportionment, is very like the use of the evidence introduced on the reopening of this

case in 1941, relative to the period 1908 to 1938, allegedly for the purpose of showing and relating to the effect purely of the Caddoa Reservoir, but which was instead devoted throughout the brief to the question of equitable apportionment.

We might add that if the purpose which Colorado claims this stipulation was to serve, was intended, not a stipulation but a compact would have been entered into between the two states, or a consent decree entered in this case which would have disposed of the case, and the voluminous testimony taken thereafter would have been unnecessary.

To infer that Kansas has committed itself and its citizens to the principles contained in that stipulation is a rather violent assumption, in view of the fact that thousands of pages of evidence have been taken since that time, and in view of the fact that Kansas was, at that time in this lawsuit, and is still vigorously contending, for an apportionment far greater than the division mentioned in the stipulation.

IX. The So-Called 1916 Settlement

The settlement referred to arose with respect to suits brought by some of the Garden City group of ditches seeking to secure a recognition of their priorities as against Colorado water users. It was identical in its nature to that of The Finney County Water Users' Association which Colorado by this action sought to enjoin, and which right the Master recognized. Neither Kansas nor Colorado were parties to that litigation. If the suit of The Finney County Water Users' Association is without foundation and improperly brought, those cases were likewise without foundation and improperly brought.

Colorado could have pursued the same action at the time they were instituted as she did some ten years later in the case involved in this action. Instead the Colorado users secured a respite from any interference with their unrestricted use of water by an alleged settlement wherein a sum of money was paid to the private interests, and the alleged granting to the Kansas interests of a priority of August 27, 1910. This settlement, or the priorities therein purported to be granted, was never recognized by the state of Kansas or by the State of Colorado nor its water officials. A complete examination of Kansas Exhibit 2 furnished by the State of Colorado, and which contains all

of the recognized priorities in the Arkansas River basin fails to disclose any priority of this date under the name of any Kansas ditch, or any Kansas water user. If the solution of interstate water litigation is a matter for settlement only between the states, or by decision of this Court, then any alleged settlement between private interests has no place in a controversy involving the equitable apportionment of the water of the Arkansas River as between the states of Kansas and Colorado.

X. Colorado's Contention That the Master's Recommended Apportionment Would Result in the Taking of Water From Established Colorado Uses Seeks Merely to Preserve a Condition Which the Master Has Found to be Inequitable and a Present Invasion of Kansas Rights.

Colorado in its brief, under heading (b) at page 74, makes the following statement:

> "That the report of the Master . . . would result in taking water from established Colorado uses . . . ."

and again at page 80, under heading (f), it states:

> "The recommended apportionment would require Colorado to forego present uses in order to deliver water to Kansas at the state line."

This is a complete avoidance of the real question in issue as to what constitutes an equitable apportionment.

While defendants do not admit that the equitable apportionment recommended by the Special Master will injure Colorado water users, as we shall hereafter point out, even assuming for the sake of argument that it would result in some deprivation of past use, if such uses constituted an invasion of Kansas' equitable share of the stream, if those past uses have resulted in depriving Kansas water users of some small portion of the basin water supply to which they are equitably entitled, such argument seeks merely to attempt to induce this Court to recognize an alleged right to all present existing water uses in Colorado, which is based upon a substantial wrong.

The Master refused to follow this specious contention of Colorado, and recognized the decisions of this Court in water cases where, regardless of alleged private rights, or even state interests, restoration of the equities was compelled.

The Supreme Court of the United States has said that use within a state must be within the limits of the state's equitable share. In the case of *Hinderlider v. La Plata River and Cherry Creek Ditch Company*, 304 U. S. 92, 58 Sup. Ct. 803, the ditch company had a decree under an adjudication of January 12, 1898, although it is not disclosed how much earlier its appropriation of water was

made or the date of its filing, and had been exercising its rights under such decree and applying water to its lands since that time. At the time of its decree, and for many years thereafter, the rights of the State of New Mexico and of the State of Colorado as to their equitable apportionment of the stream flow involved had not been determined. This was finally determined in approximately the year 1923 by an interstate compact, which as the court pointed out served the same purpose as a judicial decree. Later, when, in the administration of the interstate compact, water was withheld from the plaintiff ditch, it brought the action in question to enjoin the state engineer from closing its headgates and thus depriving it of water. In refusing to recognize the contention of the ditch company the court said, at page 102:

> "It may be assumed that the right adjudicated by the decree of January 12, 1898, to the Ditch Company is a property right, indefeasible so far as concerns the State of Colorado, its citizens, and any other person claiming water rights there. But the Colorado decree could not confer upon the Ditch Company rights in excess of Colorado's share of the water of the stream; and its share was only an equitable portion thereof.
>
> "The claim that on interstate streams the upper State has such ownership or control of the whole stream as entitled it to divert all the water, regard-

> less of any injury or prejudice to the lower State, has been made by Colorado in litigation concerning other interstate streams, but has been consistently denied by this Court."
>
> "The decree obviously is not *res judicata* so far as concerns the State of New Mexico and its citizens who claim the right to divert water from the stream in New Mexico."

and at page 108:

> "Fifth. As Colorado possessed the right only to an equitable share of the water in the stream, the decree of January 12, 1898, in the Colorado water proceeding did not award to the Ditch Company any right greater than the equitable share."

In the foregoing case the equitable rights of New Mexico and Colorado were not defined until long after the diversion and use and adjudication of the ditch company, but the Supreme Court had no hesitancy in declaring "that the Colorado decree could not confer upon the Ditch Company rights in excess of Colorado's share of the water of the stream; and its share was only an equitable portion thereof," even though the determination of what such equitable apportionment was came long after the beneficial use by the ditch company.

So in the Arkansas River basin existing uses or old priorities cannot properly form the basis of equitable

considerations in determining the apportionment, for they may be the very basis of the inequity. When such apportionment has been decreed on the basis of need and right, these other factors become subservient thereto.

The fact that the equitable apportionment has not as yet been determined, should not be taken to mean that existing uses should limit or circumscribe the apportionment in arriving at a decision, because of a specious claim that it would be inequitable to deprive Colorado users of some past benefits. In *Wisconsin v. Illinois*, 278 U. S. 399, 73 L. Ed. 426, a water case, the extent of the right was the fundamental issue to be determined, but in its decision the Supreme Court of the United States did not hesitate to compel the complete restoration of water to conform to its judgment. The subject of dispute in that case was the right of the complainant states therein to have the water level of the Great Lakes maintained at a point which would permit utilization of docks and harbors and navigation upon the lakes. The defendant state, through one of its agencies, a sanitary district, was diverting water from Lake Michigan for the purpose of diluting and carrying away the sewage of Chicago. Over $100,000,000.00 had been expended by the sanitary district in constructing a canal and providing sewage works.

The court had first to determine the rights of complainants. It did so, and found that the complaining states had the right to have the level of the lakes maintained at a prescribed level. It found that the defendant state should be limited to a diversion which would not reduce the lake levels beyond that point, and definitely fixed the amount of water which could be diverted. The restoration of the just rights of the complainants was decreed where the court said:

> "It therefore is the duty of this court by an appropriate decree to compel the reduction of the diversion to a point where it rests on a legal basis, and thus to restore the navigable capacity of Lake Michigan to its proper level. The 'sanitary district' authorities, relying on the argument with reference to the health of its people, have much too long delayed the needed substitution of suitable sewage plants as a means of avoiding the diversion in the future. Therefore they cannot now complain if an immediately heavy burden is placed upon the district because of their attitude and course." (278 U. S. 367, at page 420.)

It might well be said in the present case that the State of Colorado, relying on the fallacious argument that their lands are a barren waste and are unable to produce crops except through irrigation, and upon the contention that they are entitled to all of the water supply which they are

able to capture from an interstate stream, has too long delayed its termination of unwarranted depletion, and "Therefore they cannot now complain if some additional burden is placed upon them because of their attitude and course."

The complaint that the doing of equity will compel some modification of present inequitable uses is a strange contention in the light of the declaration in its Bill of Complaint that the State of Colorado is willing to do equity. It is, however, a reflection of a continued policy maintained over a long period of time.

That the rights and equities of Kansas never have been considered in the execution of Colorado policy is nowhere better illustrated than by the statement of Engineer Hinderlider in the 24th biennial report for the years 1927 and 1928, at page 34:

> "As noted in the forepart of this article practically all of the water escaping into Kansas is the result of tributary flow entering the river in the lower reaches of the valley." (R. 1739.)

This statement does not reflect any consideration of, or any respect for, the equitable rights of Kansas to stream flow. This right in the contemplation of Colorado was only a right to such water as could not be used or

captured within that state. Kansas' right was to be satisfied only from vagrant waters that escaped from the confines of Colorado control. Kansas' right was considered to be only the dregs remaining after the River had been drained of most of its utility. Whatever Colorado did was done at her own peril. Colorado was willing to take this gamble, for by the postponement of the time of defining the respective rights of the two states to receive the benefits of the Arkansas River stream flow millions of dollars' worth of water could during such time be applied to her benefit at the expense of the State of Kansas.

In this case Colorado has attempted to put "the cart before the horse." Instead of attempting to base the establishment of the rights of the two states upon the equity of need, which is fundamental, she is attempting to establish an equitable right upon her present inequitable depletion, thereby attempting to establish a right upon the basis of a wrong. In fact, a Colorado witness has constantly referred to "Kansas' historical use of water," as if a use, limited by deprivation and the wrongful act of another could ever become the basis of establishment of a right.

XI. Elimination of Wasteful Practices in Colorado Would Benefit Irrigation Therein as Well as Satisfy the Master's Equitable Apportionment.

When we analyze Colorado's existing uses, which she seeks to maintain undisturbed in spite of the manifest inequity between the two states, we find a situation existing, arising from her methods of water administration, which results in uneconomical use and waste within her borders. At page 75 of Colorado's brief we find this statement:

> "There is no finding by the Master of any waste by Colorado in the irrigation practices followed in that state. Kansas does not except to the failure of the Master to make such a finding. The conclusion is thus justified (in fact, it is required by the evidence) that Colorado has not been wastefully using water."

Defendants see no reason why the Master should make such a finding. It is not necessary in any sense to the determination of the question of what should be the equitable apportionment. Neither is waste a material issue in determining that the equities should be restored, since water, whether economically used or wastefully used, is not pertinent to a determination whether it has been *wrongfully* used in deprivation of the rights of another. However, the statement above quoted requires some ref-

erence to the voluminous evidence in the record which demonstrates conclusively that Colorado's present use of water is both uneconomical, extravagant, and damaging to her own interests.

An interstate river problem is viewed in the light of economical use of water, for the reason that rivers are a common resource to states, and the potential irrigable lands are much greater than the available supply. Uneconomical use of water in one area deprives some other area of the opportunity of placing irrigable lands under irrigation (R. 1714).

If, as this Court has said, "A river is a treasure. It offers the necessity of life which must be rationed by those who have power over it" (*New Jersey v. New York*, 283 U. S. 336, *supra*), and if equitable distribution of benefits from the stream flow of the river becomes the basis of such rationing, then the economical use of water becomes of paramount consideration in determining the relative equities of two sovereign states.

(a) The Economical Use of Water

To secure the largest benefit from the use of water, by the greatest acreage the greatest number of individuals and communities, consideration must be given to the farm as a whole so that more acres may be covered, more men

given employment; and more families be maintained on the land. By an economical use of water greater benefits may be obtained for a greater number of people, and provide for a much larger happiness than by applying a greater amount of water on a smaller acreage (R. 2203).

Kansas Exhibit 100 is a tabulation of experiments made in Utah, at Logan Experiment Station in connection with the United States Department of Agriculture on the crop producing power of thirty acre-inches of water applied to different acreages of land. This exhibit can hardly be summarized in a factual statement, and is therefore set out in full:

Crop	One acre 30 inches deep	Two acres 15 inches deep	Three acres 10 inches deep	Four acres 7.5 inches deep	Six acres 5 inches deep
Wheat— Bushels grain	47.51	91.42	130.59	166.16	226.86
Wheat— Pounds straw	4,533	7,908	10,356	13,204	17,916
Corn— Bushels grain	97.12	187.86	268.56	316.56	
Corn— Pounds stover	10,390	16,558	18,021	28,756	
Timothy— Pounds hay	6,054	7,688	11,739	11,928	
Sugar beets— (Tons)	20.82	38.90	55.89	64.84	82.68
Potatoes— (Bushels)	195	373	456	544	691
Alfalfa— Pounds hay	8,840	15,093	29,653		

The foregoing exhibit indicates that the use of the number of acre-feet of water which will produce the most satisfactory yield from the standpoint of the irrigator is

not the criterion of water use which will produce the greatest total yield or benefits from the standpoint of the basin as a whole (R. 2206). It further shows why the desire for a greater yield per acre under irrigation may induce a use of water which, when viewed from the standpoint of the entire basin, may be uneconomical and may reduce the benefits to be obtained from the water supply when considered from the standpoint of the basin as a whole (R. 2206).

Engineer Chew of Water District 2 (Arkansas River basin) is quoted in the 18th biannual report of the State of Colorado of date December 8, 1916, as follows (R. 1724):

> "There never was a better demonstration than this season, proving that in past years overirrigation has been indulged in to the detriment of crops and land injured and waterlogged to a marked extent. In my long experience I have noted that the years when water was scarcest and had to be economically used, better crops resulted."

The facts show that F. H. Newell, former director of the United States Reclamation Service, states:

> "In the history of irrigation in this country there has been evident a gradual but very definite evolution in the ideas of what constitutes proper use of water. . . .

> "In the course of this evolution, the doctrine of beneficial use has become established, but in future development this doctrine must in many cases merge into, or be supplanted by that of economic use.
>
> "The doctrine of beneficial use looks to individual interest; that of economic use to the general welfare of society as a whole. So far as possible water charges, systems of distribution, and regulations should be so adjusted as to make the interest of the individual water user coincide with this public interest."

Doctor Widstoe of Utah, in Principles of Irrigation Practice, states:

> "The new duty of water must be based upon all the knowledge in the possession of man. The water in the stream must be used to cover the largest possible area, so that more men may be given employment and more families maintained on irrigated lands." (R. 1716.)

A diversion of water materially greater than 1.5 acre-feet per acre for direct flow canals is unnecessary, uneconomical, and deprives other areas in the river basin of adequate water supplies.

(b) Excessive and Uneconomic Use by Colorado

The record shows that in the Arkansas basin in Colorado an individual, or ditch, under the protection of an early and unscientific adjudication may apply to the land

lavish and uneconomical quantities of water regardless of a wider and more productive use, and with the state powerless to interfere. A part of this is due to the Colorado system of adjudicating a water right. As an example: In District 17 earlier decrees used one second-foot to 38.4 acres, and also one second-foot to 55 acres; in District 67 approximately one second-foot to 55 acres. Most of these ratios were fixed in the early days of irrigation before actual scientific study of scientific duty of water had been determined. Under present knowledge and experience one second-foot of water can be made to serve 200 acres or more (R. 1378). Liberal and often excessive quantities of water have been adjudicated to Colorado canals. No limit is set by the state as to the amount of water which may be applied to an acre of land. The state is not a party to the adjudication (R. 1364). In Colorado no limit is set as to the maximum water diversion in acre-feet per acre on irrigated lands.

A still further condition, which directly arises out of the method of adjudication of water rights in Colorado on the basis of cubic feet per second alone, comes from the increased water opportunity not originally existing, but which arises through the years as irrigation is practiced through the utilization of seepage and return flow, which

except for the method of adjudication on a second-foot basis would be available to satisfy water uses downstream —in this case, in Kansas.

The period of time in which a ditch would divert water would be materially increased by the use of the return flow water. As an illustration, a ditch which in the early years of irrigation could divert water for 70 or 80 days during the year would be enabled to divert for 140 or 150 days and increase the amount of land served thereby. This increased use could result in a diversion of three or four acre-feet per acre, instead of the two acre-feet per acre of irrigated land originally served (R. 1385). The effect in the Arkansas valley is that many of the older ditches have in fact substantially increased the number of acre feet of water diverted, without any additional adjudication of any sort being resorted to (R. 1385). The effect of this is best stated by State Engineer Hinderlider of Colorado:

> "The penalties which are being paid for the defects in the Colorado form of water adjudications are numerous. One of the most prevailing of these penalties is that nearly every ditch decree given by the Colorado courts,—particularly in practically all of the earlier decrees,—allows too large a volume of water. In other words, nearly every ditch priority was overdecreed. These over-de-

creed rights present a constant difficulty in the administration of the waters of a stream." (R. 1378-'79.)

"Perhaps the chief defect in this Colorado system of administration is that the powers of the water officials are not sufficiently extensive. Their duty is largely limited to seeing that each ditch or reservoir receives from the stream its adjudicated amount of water in its order of priority. As previously stated, many of the ditch decrees are excessive (particularly the older ones), and the courts have ruled that after water has been legally diverted from the stream, the water officials have no further control over the same. This makes it difficult or even impossible for the water officials to pass upon the matter of economical use which as hereinabove stated, the Colorado courts have read into every adjudication decree." (R. 1379.)

"Another penalty is that there is no time limit set out in the Colorado decrees,—that is, the volume of the priority is only adjudicated in second-feet. The result is that the holder of the priority claims the right to a continuous flow of his decreed volume whenever there is water in the stream to supply the same. This results in a great deal more water being diverted under the older priorities than is actually needed by the appropriator. Of course, a considerable part of these over-diversions find their way back into the stream, but are not always available to the appropriator next in order of priority. There is also some loss, even when the return waters are considered." (R. 1381.)

"The penalties resulting from failure to give the water officials more power over the administration

> of the water, are very apparent. The diverter, for all practical purposes, is made the judge of his own necessities up to the limit of the decreed priority of his ditch. The public, as the ultimate owner of the water rights, has no representative to pass upon the question of the wastefulness of the diversion. Consequently, under nearly all of the older ditches very much more water is diverted than can be beneficially applied. A diversion of ten acre-feet during each irrigation season per acre of land is not unusual under some of the older ditches. Of course, as this over-diverted water gets back into the stream; but of necessity the evaporation and other losses are very high in the case of these excessive diversions, and they may also adversely affect a ditch's ability to take water because of the relative locations of its headgate and the locus of the return flow." (R. 1382.)

Judge A. W. McHendrie, one of the esteemed counsel for Colorado, in addressing the State Bar Association of Colorado said:

> "The practical application of the doctrine of priority of appropriation is admittedly unscientific and unsound in securing the ultimate objective—to wit, the great beneficial use of a limited resource. . . .
>
> ". . . The public interest becomes submerged in the individual interest. This results, in many cases, in an excessive use of water by the older appropriators, to the exclusion of a later appropriator who could, in fact, make a much more beneficial use thereof. It permits of wasteful and uneconomic practices." (Kansas Exh. 8.)

The facts amply support these statements.

A study of diversions by the large canal systems in the main valleys east of Canon City shows that excessive diversions of water are being made by some of the larger canals. Canals with senior rights divert excessive volumes of water for the lands irrigated, and do so because water is continuously available under ordinary conditions to their river priorities (R. 1724).

The Rocky Ford canal has very old water rights, and irrigates close to 8,000 acres of land. During the twelve-year period 1920 to 1931 its average yearly diversion was 50,000 acre-feet, or over six acre-feet per acre irrigated (R. 1724). The Catlin canal irrigates about 19,000 acres of land. Its average yearly headgate diversion was 85,000 acre-feet, or 4.5 acre-feet per acre for the twelve-year period 1920 to 1931 (R. 1725). The Lamar canal irrigates close to 7,000 acres. Its average yearly headgate diversion was 35,000 acre-feet, or five acre-feet per acre for the twelve-year period 1920 to 1931 (R. 1725). There is a cluster of canals at Canon City irrigating 10,000 acres of land, which divert from seven to eight acre-feet per acre, and even greater quantities of water (R. 1725).

Division Engineer Chew of Water Division 2 (Arkansas River basin) of date December 8, 1917, on pages 86

and 87 of the 19th biennial report of the State Engineer of Colorado said:

> "The decrees entered in this Water Division are uniformly and greatly excessive in amounts and under the ditches given these excessive decrees the acreage irrigated has been continuously increased and the use of water under the direct flow ditches, where the water is used merely because it is in the river, whether it is needed or not, has led to great waste. This excessive use of water has been indulged in by the users to such an extent that thousands of acres of land have been turned to seepage and become waste.
>
> "An estimate of the amount of water actually diverted from the river for the use of irrigation of lands under the various ditches shows that there is a variation in the amounts diverted in proportion to the lands irrigated, running from practically one acre-foot up to as high as *ten acre-feet* to the acre.
>
> "The difficulty in the distribution of water is that it is based upon the flow of water in cubic feet per second instead of acre-feet dependent upon the necessities of the user. If water could be had at the crucial time in plant growth, it can be made to do double duty of water applied whether it is needed or not, and I have found that the greatest duty of water is therefore attained in connection with storage systems, where the application of water can be made at the crucial time and not dependent upon the fact as to whether water will be in the river available for use.

"While, as stated above, the use has varied from one acre-foot up to ten acre-feet to the acre, as I believe to the great detriment of the lands receiving these excessive amounts, I think from the experiments that have been conducted in the experiment stations of the several arid states, it must be concluded that two acre-feet measured at the headgate is sufficient for the proper irrigation of growing crops, if applied at the proper time, grown in the Arkansas Valley, and while I am aware of the fact that under the decrees ditches have certain vested rights, yet I firmly believe that the excessive use of water should be limited and I believe that a law should be placed upon the statute which would limit the amount of water which any ditch would have the right to divert during an irrigation season not to exceed two acre-feet to the acre." (R. 1722-24.)

Under strict economic use by Colorado canals between Canon City and the Kansas line approximately 290,000 acre-feet of dependable water could be made available yearly at the Kansas line for Kansas needs (R. 1735). This 290,000 acre-feet of water saved under economical use would be available to Kansas irrigators during the irrigation season (R. 1736). The loss of 290,000 acre-feet of water would not necessitate the abandonment of any lands now under irrigation in Colorado (R. 1736).

Apparently the State of Colorado early adopted a system which resulted in lavish and uneconomical use. This

system has remained unchanged since its early adoption, regardless of the fact that the uses which it protects and perpetuates are recognized by Colorado state officials as improper and unsound in the face of modern knowledge of economic use. Although the State of Colorado may be powerless in the face of vested irrigation interests to change this system within her own borders, regardless of the extent to which the public good must be sacrificed for individual ditch gain, it should not be allowed to become the means through which a sister sovereign state is deprived of the benefit of its use for the general good and for more productive results from the unit use of water. If Colorado desires to adjudicate the water supply to which she is entitled, so that it can be used in such lavish fashion that thousands of acres in the Arkansas River basin in Colorado have gone to seep, that is Colorado's business; but when water in Colorado through excessive use is producing seeped areas, she should not complain if this water is surrendered to a sister state where scientific use can be made of it in the interests of greater crop production. Selfish interest must surrender to the general good.

It was early announced by the Supreme Court in *Busey v. Gallagher*, 87 U. S. 577, 22 L. Ed. 452, that:

> "The right of the first appropriator is not unrestricted and must be exercised within reasonable limits with reference to the general condition of the country and the necessity of the people, and not so as to deprive a whole neighborhood or community in the use of the water and vest an absolute monopoly in a single individual."

We believe that the application of the principle stated will be followed by this Court, and that it will be applied with equal facility to a situation where a state must be required to exercise a right within reasonable limits in such a way as not to deprive a lower state of the use of water.

Again in the case of *Wyoming v. Colorado*, 259 U. S. 419, 66 L. Ed. 999, the court stated:

> "Both states recognize that conservation within practical limits is essential in order that needless waste may be prevented and the largest feasible use may be secured. We think that doctrine lays upon each of these states a duty to exercise her right reasonably and in the manner calculated to conserve the common supply." (66 L. Ed. 1021.)

(c) Economical Use in Kansas

In Kansas, water scarcity compelled individual interests to give way to the right of irrigators as a whole. Necessity compelled irrigators to make the greatest possible use out of the dregs of a water supply remaining in the stream.

Kansas ditches were confronted with a situation where resort to some system which would develop the maximum benefit from, and the most economical use of, a meager diversion possibility was essential, unless irrigation was to be abandoned completely.

Division of the limited supply in such a way that each of the ditches would get some water each season has become an accomplished fact. In April, 1912, a consent decree was entered in the District Court of the United States for the District of Kansas. It concerned the five ditches known as the Amazon, Great Eastern, South Side, the Farmers Ditch, and the Garden City Ditch, the Farmers Ditch, the property of Finney County Water Users' Association (R. 2662). The decree provided for a system of rotation or proration among the ditches of the water supply available. It divides the total amount to which any of the ditches are entitled, among all of them, and then provides for a rotation from ditch to ditch when there is not sufficient flow (R. 2663). (For proportions of distribution of water by rotation see pages 27 and 28, Reply of State of Colorado.) This decree provides for division of water by quantities, so many acre-feet to each ditch, in accordance with total quantity of water available (R. 2665). This in effect provided for dis-

tribution of such water as was available on an acre-foot basis.

This consent decree resulted from an effort by the large ditches in Western Kansas, regardless of priority, to make the best use possible of an extremely inadequate water supply. (R. 5992.) Concerning it Witness Knapp testified, "From my knowledge of its operation it effects the most economical use of water possible under those circumstances" (R. 5992). It operates to divide the meager supply between all of the ditches in a manner which permits all of them to operate under a restricted use of water. In the absence of such an arrangement, if water had gone to the ditches in the order of their priorities, a number of the ditches could not have received water enough to have maintained an operating unit. (R. 5993.)

This acre-foot basis provides the only economical method (distribution by quantity rather than rate of flow) possible with a limited supply. Kansas is making the best possible use of the present erratic water supply from Colorado for irrigation, due consideration being given to irrigation economics and water supply handicaps (R. 1743). The distribution of water in conformity with this decree was in charge of a water bailiff appointed by the United States District Court for the District of

Kansas until 1933, when the Division of Water Resources of the State of Kansas, by legislative act, took over the administration and distribution of this water.

At the very close of Colorado's brief, at page 107, appears this statement:

> "An important natural resource must be conserved and utilized that the greatest possible benefit is obtained."

and yet in the face of such a statement, and in the face of the evidence heretofore referred to, showing wasteful and extravagant uses within the State of Colorado, she complains that the equitable apportionment of the Master will disturb those wasteful practices, and that the equitable apportionment made by the Special Master for the express purpose of providing the greatest possible benefit from the water resources of the Arkansas River should not be accepted by this Court.

Apparently Colorado's interpretation of equitable distribution of benefits from the flow of the stream is that she is entitled to retain all of the benefits arising from agriculture under irrigation and give to Kansas only those benefits arising from dry-land farming, without the assistance of a dependable and substantial water supply, while, as pointed out, the evidence clearly shows

that if excessive and unreasonable uses in Colorado which are clearly recognized by its water officials were terminated, from that single source alone there would become available to satisfy any equitable apportionment approximately 290,000 acre-feet of water.

It is true, and cannot be denied, that if Colorado, by adhering to existing uses, chooses to perpetuate a system which allows the older appropriators to make headgate diversions of 5, 6, 8 and 10 acre-feet per acre in order that these privileged priorities would have the benefit of a few more bushels or tons per acre in the yield of crops, there is some force to their argument, but this hardly comports with the principles of equity, even as respects the water users within its own borders. The perpetuation of such a system would of course be optional with Colorado. It would be the result of choice, and not of necessity.

Certainly Kansas and its citizens should not be penalized and deprived of the opportunity to make this water yield manyfold its present production, as it is now utilized, merely because Colorado wishes to protect a lavish and uneconomic use of water rather than ration it in the manner where it will produce the highest returns and bring its benefits to the greatest number of acres. How-

ever, assuming that Colorado desires to perpetuate her present uses, still the evidence shows there is available to Colorado within her own borders, and capable of being utilized, approximately 300,000 acre-feet of water which can be brought into the Arkansas River basin by transmountain water diversions (R. 1456), and that already within the last few years this has been developed to the extent of 50,000 acre-feet or more. This would be hitherto unused water. It will be immediately urged that this water is no part of the supply of the Arkansas River, and therefore not a proper subject of consideration in equitable apportionment of that water supply. This statement is true, but we are here directing our attention to Colorado's claim that she is unable to make restoration to Kansas of an equitable share of stream flow without great damage to her own irrigators.

If equitable apportionment requires the State of Colorado to restore a definite dependable water supply at the state line in order to bring about an equitable apportionment of the benefits to Kansas, little weight should be given to a contention that that portion of Colorado's acreage, which has been developed at the expense of Kansas, should be protected, when Colorado has a water resource which can be utilized to replace for her own use

that water heretofore wrongfully withheld. It will, of course, be urged that she should not be compelled to bear this expense for the sake of supplying water to Kansas irrigators. This she would not be doing. Kansas for years has borne the loss of those benefits, which she was rightly entitled to enjoy, and which she would have been enjoying had not Colorado depletion withheld from Kansas the use of that water. Whatever would be the cost of bringing such transmountain water into the Arkansas River basin would only be for the purpose of supplying her own ditches with water which they have been compelled to restore to Kansas since, as was stated in the case of *Hinderlider v. La Plata River*, that use was beyond the equitable share of the waters of the river which Colorado or her citizens had a right to enjoy.

But there still is a third factor by means of which Colorado could satisfy any schedule of stream flow which the Master may find comports with equitable apportionment without seriously affecting the utility of stream flow for Colorado use. This is through the utilization of the existing reservoir storage in Colorado, to pass surplus waters in usable supplies across the state line as a substitute and in lieu of uses by upper ditches in Colorado of stream flow as it passes their headgates.

As we have previously pointed out in this brief, with the reservoirs now existing within Colorado, among which is the newly constructed Caddoa reservoir, the waters of the Arkansas River including flood waters are for the most part subject to control within the borders of the State of Colorado, and these quantities may well be turned to the practical use of satisfying Kansas' "right," and creating a dependable flow commensurate with such right. Of course it will be urged that these reservoirs, with the exception of Caddoa, constructed at Colorado's expense should not be used for the benefit of Kansas. Such argument is fallacious in that they would not be used for the benefit of Kansas ditches, but only for the benefit of those Colorado ditches, who by reason of their wrongful depletion of stream flow into Kansas would be compelled to permit such water so wrongfully withheld to pass down the stream to rightly satisfy Kansas' equitable share.

As some indication of the quantities of water available for such purpose in Colorado reservoirs and without reference to Caddoa, the record shows the storage amounts which are available on May 1 in the Colorado reservoirs. This water might well help to satisfy any water schedule set up by the Master to bring about the

restoration of depleted stream flow into Kansas resulting from diversion of the entire ordinary flow of the stream during the May, June and July period.

From 1926 to 1931 the record shows the actual quantities of water in storage in the Arkansas basin reservoirs in Colorado on May 1. These figures are as follows (Kansas Exh. 66):

1926	219,861 A. F.	Gain over Nov. 1, 1925	102,861 A. F.
1927	122,553 A. F.	Gain over Nov. 1, 1926	35,553 A. F.
1928	173,328 A. F.	Loss over Nov. 1, 1927	20,672 A. F.
1929	246,806 A. F.	Gain over Nov. 1, 1928	52,806 A. F.
1930	312,753 A. F.	Gain over Nov. 1, 1929	73,353 A. F.
1931	261,899 A. F.	Gain over Nov. 1, 1930	66,899 A. F.

With these amounts shown to be in storage on the 1st day of May, the record shows that during May, June and July of 1926 there were 49½ days out of 92 days when the flow into Kansas was less than 200 second-feet. Yet from water in storage Colorado could have supplied 50,000 acre-feet per month of additional state line flow without changing Colorado's direct diversions for irrigation.

During May, June and July of 1927 there were 72 days out of 92 when the flow into Kansas was less than 200 second-feet. Yet from storage Colorado could have supplied 40,000 acre-feet per month without changing Colorado's direct diversions for irrigation.

During May, June and July of 1928 there were 37 days

out of 92 when the flow into Kansas was less than 200 second-feet. Yet from storage Colorado could have supplied 50,000 acre-feet per month without changing Colorado's direct diversions for irrigation.

During May, June and July of 1929 there were 86½ days out of 92 when the flow in Kansas was less than 200 second-feet. Yet from storage Colorado could have supplied 50,000 acre-feet per month without changing Colorado's direct diversions for irrigation.

During May, June and July of 1930 there were 78 days out of 92 when the flow into Kansas was less than 200 second-feet. Yet from storage Colorado could have supplied 50,000 acre-feet per month without changing Colorado's direct diversions for irrigation.

During May, June and July of 1931 there were 75 days out of 92 when the flow into Kansas was less than 200 second-feet. Yet from storage Colorado could have supplied 50,000 acre-feet per month without changing Colorado's direct diversions for irrigation.

It would therefore clearly appear that with 290,000 acre-feet of the water supply saved by reason of a more economical use thereof, with approximately 300,000 acre-feet of additional water available for use in the Arkansas River basin in Colorado, and with several hundred thou-

sand acre-feet available in storage on approximately the 1st day of May in Colorado reservoirs, the State of Colorado and its water users are in position to restore an equitable apportionment of the benefits from the flow of the Arkansas River to Kansas, without compelling a single acre of land in Colorado now using water from this river to revert to dry farming conditions similar to those which Colorado by her depletion of stream flow into Kansas has imposed upon Kansas irrigators.

Throughout this long controversy the State of Colorado has attempted to maintain the position that it is entitled to all the water of the Arkansas River that originates within its borders. The negation of this theory by this Court did not change the State's attitude. Later, in the case of *Wyoming v. Colorado*, the same doctrine was urged, and again it was announced that an upper state could not invade the equitable rights of a lower state to the use of the waters of an interstate stream. In spite of these declarations of the highest court, Colorado nevertheless continued to construct reservoirs, divert more water, irrigate more acres, with the full knowledge from such previous declarations that such uses might constitute an invasion of Kansas' equitable share of the water. With the knowledge that until a determina-

tion of the equitable apportionment of the Arkansas River between the State of Kansas and the State of Colorado was made with certainty and definiteness, no use of water would vest in either Colorado or her citizens, a right greater, or beyond that, constituting her fair and equitable portion. Colorado authorities well knew that the time must come when they would be compelled to replace in the stream sufficient usable flow to restore a right to Kansas, of which she, as a sovereign state, could not be deprived.

XII. Colorado's Objections to the Plan of the Master Securing the Delivery of the Apportionment to Kansas, and Determining the Amount as it Originates, Through the Use of Index Stations, Are Untenable.

Colorado states at page 65 of its brief, "The recommendations of the Master as to the proportionate division between the states are uncertain." The argument submitted by Colorado to support this statement is its own refutation. Complainants say that the Master recommends that the average dependable supply of the River, which he finds to be 1,110,000 acre-feet should be apportioned between the states on a basis of 925,000 acre-feet annually to Colorado and 185,000 acre-feet annually

to Kansas. There is no uncertainty in such a statement of apportionment.

Complainants further argue respecting the apportionment, "This is on a ratio of five to one." Apparently the report of the Master was sufficiently certain to enable Colorado to arrive at this correct statement of the ratio of apportionment. Defendants are in complete agreement with complainant's statements of the apportionment made by the Master, as well as the ratio of apportionment. Certainly since all parties are in agreement there can be no possible objection on the part of Colorado to translating the ratio of five to one into the percentage which such ratio reflects, namely 83.33 percent to Colorado and 16.67 percent to Kansas. Defendants have suggested in their exceptions and brief that these percentages be added to the finding of the Master, so that not only the amount of apportionment but the percentage of apportionment, which are synonymous, will both appear.

The next complaint urged by Colorado respecting the plan of the Master is stated at page 62 of its brief, "The recommendations of the Master as to measuring stations reflect a misconception of the existing conditions." An examination of the report will indicate that the Master

had a very clear conception of the existing conditions on the River and of the character of flow of the stream. The Master likewise clearly appreciated that he had for consideration a water supply which fluctuated from day to day and year to year. The report shows that he understood not only the necessity of determining the quantum of the supply available for apportionment in accordance with the natural fluctuation of the supply as it was created by nature, but also the importance of protecting the deliveries to Kansas of its equitable apportionment, once the supply to be divided was determined. Therefore, the Master's recommendations as to measuring stations are the well selected links which connect the ascertainment of the available water supply as it originates, with deliveries to Kansas, in accordance with the decreed apportionment. Two of these stations are classified as index stations. The measured flow passing such stations, although only a portion of the supply available for irrigation use and for apportionment, is of such typical character that it will serve as a satisfactory index from which can be computed the amount of the total available water supply subject to delivery in accordance with the percentage of apportionment. His statement, "The water measured at those stations will vary up or down as those

two types of water supply in the basin vary, and the burden of benefits of wet years and dry years would be borne in the same proportion as the equitable distribution of water supply is decreed," (Finding of Fact Twelve) shows no misconception of existing conditions of stream flow but a very clear understanding of it. The measuring station at the state line is for the purpose of determining that deliveries are made as decreed. Thus, the Master set up a plan, simple to administer and easy to enforce, which would follow the admonitions of this Court and provide for deliveries "upon the basis of equality of rights as to secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of the like beneficial effects of a flowing stream."

In making an equitable apportionment between the states the Master was dealing with an equitable right. He used as a basis the average annual dependable supply of 1,110,000 acre-feet, eliminating from consideration the abnormal and excessive water years. This was proper and followed the formula suggested by this Court as a proper method in the case of *Wyoming v. Colorado*.

However, although the apportionment was made by the Master on the basis of average annual dependable supply, deliveries must necessarily be made as the water

supply originates, whether in excess of or less than the average annual dependable supply. The two measuring stations suggested by the Master must serve as an index to the *actual water supply* of the basin as it originates, *not* the *average dependable supply* from which the high water years have been eliminated. The index figure of 670,380 acre-feet, referred to in Kansas Exh. 134 included the high water years of 1914, 1915, 1921 and 1923. Likewise the actual average annual water supply of the basin, found by the Master to be 1,240,000 acre-feet includes those same high water years. This requires that the basis, upon which the index station water supply shall be used to compute the total supply subject to division, must be the relationship which the 670,380 acre-foot average index supply bears to the average water supply of the basin, found by the Master to amount to 1,240,000 acre-feet, and not to the 1,110,000 acre-feet the Master found to be the average dependable supply.

In such a division it would be absurd to say that any years in the consideration of deliveries should be excluded. Is it to be assumed that because a given year happens to be one of abundant water supply, it is to be excluded from the equitable apportionment provided for in the decree? Obviously not. We should not assume,

merely because such years as 1914, 1915, 1921 and 1923 were excluded in the determination of dependable supply, that the water supply of such years is not to be divided and apportioned by the same method of determination as any other year.

The Master included in his report no actual computation of the percentage of the average index water supply of 670,380 acre-feet, required to give deliveries to Kansas of one-sixth of the actual water supply of the basin. It is obvious, however, that it requires 30.87 percent of the average annual index flow of 670,380 acre-feet to equal 16.67 percent or one-sixth of the average annual basin water supply of 1,240,000 acre-feet as determined by the Master.

Colorado makes the statement at page 65 of its brief:

> "It thus appears that there are three possible interpretations of the report so far as the requirement of the delivery to Kansas is concerned, namely (1) one-sixth or 16.67 percent of the combined index flows; (2) 30.87 percent of the combined index flows; (3) 27.59 percent of the index flows."

An analysis of these three suggested interpretations of the Master's decree will indicate that (1) and (3) have no reasonable support from the language of the decree. The first suggestion, that deliveries to Kansas shall con-

stitute only 16.67 percent of the combined index flows, hardly deserves discussion. No one would conclude from a reading of the Master's report that the deliveries of water to Kansas were to constitute 16.67 percent of index flows rather than 16.67 percent of the basin water supply. The Master has clearly shown that he has apportioned to Kansas 16.67 percent of the basin water supply, and not 16.67 percent of 670,380 acre-feet. Is it to be assumed that the Master, having apportioned to Kansas 16.67 percent of the basin water supply, would in providing for deliveries effectuate the delivery of only 9.8 percent of such available supply? Obviously not. Only one attempting to minimize deliveries to the smallest possible amount would so interpret the Master's report. Is the plan recommended by the Special Master, of using index stations to compute the daily water supply of the basin subject to irrigation uses, in order that the burden of dry years and the benefit of excessive water years may be borne by both states in the same proportion as the equitable supply is decreed, susceptible of an interpretation which would completely destroy that equitable distribution? We believe not.

If we turn to a consideration of the third interpretation of the Master's plan of computing deliveries, namely

that it might be thought to be 27.59 percent of the combined index flows, we find again that in suggesting such interpretation Colorado is at complete variance with the only conclusion to which the language used by the Master is susceptible. This percentage, it is true, is the correct ratio which the index water supply bears to the total annual dependable water supply, which the Master used in determining the equities, but, from which, as before stated, were excluded the high water years.

This brings us to the inevitable conclusion, that the only correct percentage which can be applied with respect to the apportionment of index flows is 30.87 percent to Kansas, the amount suggested by the defendants and referred to in defendants' original brief.

Defendants believe that the report is clear as to the purpose served by the two index stations selected. Three questions and their answers make this manifest—

(1) Does the actual water measured at these two stations constitute the water supply available for distribution? The answer is "No." The average of the water at these two stations constitutes only about 54 percent of the average basin supply.

(2) Does the flow passing these two stations constitute an index from which can be computed the average de-

pendable supply? The answer is "No." The average flow at these two stations includes all high water years.

(3) Does the measured flow passing these two stations constitute an index from which can be computed the actual water supply available for distribution? The answer is "Yes."

Even Colorado recognizes that these index stations were to serve the sole purpose of computing the total supply subject to division between the states, as is clearly shown by the statement in its brief at page 63 that the combined index flows amounting to 670,380 acre-feet for the period 1908 to 1938 represented 60.39 percent of the factor used by the Master in determining equities.

The mere fact that the Master did not specifically name the percentage, either in the case of apportionment or with respect to ascertainments of deliverable amounts, is not an argument against the plan. Counsel for Colorado have no difficulty in seeing that the apportionment of 925,000 acre-feet to Colorado and 185,000 acre-feet to Kansas represents a ratio of five-sixths of the water to Colorado and one-sixth to Kansas and so state. Neither does Colorado have any difficulty in ascertaining that the index stations are to be used for the purpose of computing the water supply subject to delivery on the basis of the

delivery of 30.87 percent of the index supply to Kansas, and they so state. That actual percentage appears in their brief. They have computed it, and certainly realize that that percentage of the index flow does insure a delivery to Kansas in conformity with the water supply as it originates day by day of an amount which will equal 16.67 percent of the basin water supply.

It is because any language, regardless of its true intent and meaning, would always be subject to distortion by those whose whole policy has been to prevent the escape of any vagrant waters into Kansas, that defendants have suggested to this Court that the actual percentages be expressly set out in order that a decree of this Court will provide for administrative officials a mathematical formula, which cannot be misinterpreted.

While Colorado points out at page 102 of its brief that Kansas will receive 206,946 acre-feet, in the average year of 1,240,000 acre-feet of water supply, which is in excess of the 185,000 acre-feet as determined by the Master, they fail to point out that in the same year Colorado will receive 1,034,000 acre-feet, which is also in excess of the 925,000 acre-feet found by the Master, or 109,000 more for Colorado, and only 21,946 more for Kansas. Thus, as was clearly expressed in Finding of Fact Twelve, "the

burden of (or) benefits of wet years and dry years will be borne in the same proportion as the equitable distribution of water supply is decreed."

Colorado states at page 69 of its brief:

> "A variable flow cannot be delivered when required. Colorado is without power to make the rains fall and the snows melt at such times as will satisfy the whims or the needs of Kansas irrigators. Natural phenomena are not susceptible of control by court decree."

Kansas will agree that this Court cannot make the rains fall and the snows melt, but we are confident that, when the rains do fall and the snows do melt, this Court by a decree can compel the delivery of 30.87 percent of the index flows recorded by measuring stations, which will insure to Kansas a delivery of the equitable apportionment found by the Master to be 16.67 percent of the basin water supply.

Colorado makes the assertion at page 85 of its brief, "There is no relationship between the so-called index flows and the state line flow." In reply we ask the question—Why should there be? State line flows, as they exist, are only the residual flows passing across the state line after depletion by Colorado of practically all of the dependable flow necessary for irrigation use. As such

flows have existed in the past they are the mere reflection of a wrong, and show an invasion of a right of Kansas to have a reasonable water supply from which irrigation may be practiced with some consistency. The index flows are merely a part of the plan found by the Special Master to be the most effective means of rectifying that past wrong, and providing for delivery to Kansas something of the same quality of benefits of water as those enjoyed by Colorado, even though in its totality it will represent but a small fraction of the total benefits enjoyed by Colorado from the use of this water resource upon which the arid area in each state is dependent.

XIII. Flood Waters

Colorado states the Kansas position with relation to flood water is unfair (P. 103 of its brief).

The answer to this contention can be summed up in a few words. It is briefly this: By such disposition of the flood waters Colorado may store such of the flood waters as it has facilities for, and use it for the purpose of making deliveries to Kansas in accordance with the index water supply. In this matter the Kansas position is of benefit to Colorado. On the other hand, by this method of handling the situation the position of Kansas

is not jeopardized as a result of being charged with flood flows coming at such times and in such amounts as to be unusable.

XIV. The Solicitor General's Memorandum

The Master in paragraphs one and two of the Recommended Decree (Report pages 19-20) states, that each of the respective states "is awarded, granted and decreed *the owner and* entitled to the use of" specific quantities of water.

Colorado states at page 96 of its brief, that the question of ownership of the water of a nonnavigable stream is of no importance in the case at bar. Colorado further states that it is one of the fundamental issues in the case of *Nebraska v. Wyoming, et al.*, Original No. 7, 1942 Term, now pending and undisposed of on the docket of this Court.

A similar contention is advanced by the United States through its Solicitor General in a memorandum filed in this Court. A like memorandum has been filed by the State of Nebraska.

Defendants agree that the question of ownership has not been made an issue in this case, and are in accord with the suggestion made by the United States and the

States of Colorado and Nebraska that a decision upon this point be reserved for consideration in the case of *Nebraska v. Wyoming*, supra.

XV. Conclusion

In answering Colorado's brief defendants are necessarily limited to treatment of only a few of the many inconsistencies which appear therein. To have made a complete answer to all of them would have resulted in a complete review of all the evidence, and would have unnecessarily extended a brief which is already too long.

Colorado has made a sweeping denunciation of the entire Master's report. It has offered nothing in its place. Colorado has shown by its entire brief, and by the nature of its exceptions to the Master's report, that it does not desire this Court to enter a decree which will afford any relief to Kansas or afford even a small but useful supply of water for irrigation purposes. It still believes, although professing its willingness to do equity, that it is entitled to all of the water of this interstate stream originating within its borders, and, that any apportionment, which requires the placing of a limitation or restriction upon Colorado, amounts to the impairment of the quasi-sovereignty of that state.

Defendants feel that the apportionment of five-sixths

to Colorado and one-sixth to Kansas is a rather meager share, considering that the need for water is substantially the same in the arid region of both states. However, in order that there be finality to this long controversy, Kansas has accepted the report of the Special Master as the proper basis for a decree, suggesting to this Court only a limited number of changes, largely mathematical percentages, intended to avoid a possible misinterpretation of the Master's Recommendations.

Defendants trust that by this answer they have demonstrated to this Court that the Master's findings are fully supported by the record.

Respectfully submitted,

A. B. MITCHELL,
Attorney General of Kansas,
Topeka, Kansas,

ELDON WALLINGFORD,
Assistant Attorney General,
Topeka, Kansas,

W. E. STANLEY,
First National Bank Building,
Wichita, Kansas,
Attorneys for the State of Kansas.

W. E. STANLEY,
Attorney for The Finney County Water Users' Association, a Corporation.

No. 5 Original

In the Supreme Court of the United States

OCTOBER TERM, 1943

THE STATE OF COLORADO, COMPLAINANT

v.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS

MEMORANDUM FOR THE UNITED STATES, AMICUS CURIAE

In the Supreme Court of the United States

OCTOBER TERM, 1943

No. 5 ORIGINAL

THE STATE OF COLORADO, COMPLAINANT

v.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS

MEMORANDUM FOR THE UNITED STATES, AMICUS CURIAE

In paragraphs One and Two of the decree proposed by the Special Master it is provided, among other things, that each of the two States is "decreed to be the owner" of certain quantities of the waters of the Arkansas River. For the reasons subsequently stated, the United States suggests that the quoted language relating to the ownership of the waters be eliminated from the final form of the decree. This result could most simply be accomplished by the elimination of the words "the owner and" in the second lines of paragraphs One and Two of the proposed decree (pages 20 and 21 of the Report and Recommendation of the Special Master).

548399—43

The object of this portion of the proposed decree is to effect an equitable apportionment of the waters of the Arkansas River between the States of Colorado and Kansas. The accomplishment of that purpose requires only an apportionment of the right to use the waters; it does not necessitate a finding or declaration of ownership. The Conclusions of Law submitted by the Special Master apparently recognize that fact and contain no conclusion regarding ownership.

In the interstate cases before this Court, in which decrees of apportionment of waters have been made, the Court has never included language of ownership, but has, instead, merely used the language of right to or restraint on diversion or release of waters. *Wyoming* v. *Colorado*, 260 U. S. 1; *Wisconsin* v. *Illinois*, 281 U. S. 696; *New Jersey* v. *New York*, 283 U. S. 805. Also, in none of the compacts concluded among states for the apportionment of waters or their use is there any language relating to the ownership of waters.[1] The characteristic language of those compacts is, in substance, that their purposes are the apportionment of the waters and that the waters or their use are merely apportioned or divided in

[1] In one negotiated compact there was a declaration that the waters "are the properties of the States within which they originate and flow." Proposed Yellowstone River Compact between the States of Wyoming and Montana, 1935. This proposed compact was not ratified by the legislature of either State or approved by the Congress.

the manner specified. La Plata River Compact, Art. II, Act of January 29, 1925, c. 110, 43 Stat. 796; South Platte River Compact, Arts. III, IV, Act of March 8, 1926, c. 46, 44 Stat. 195; Colorado River Compact, Arts. I, III (a), III (f), General Laws of California, 1931, Act 1490, Vol. 1, p. 669, approved, but not quoted, by Congress in Act of December 21, 1928, c. 42, sec. 13, 45 Stat. 1057, 1064; Rio Grande River Compact, Preamble, Arts. III, IV, Act of May 31, 1939, c. 155, 53 Stat. 785; Republican River Compact, Arts. I, III, IV, XI, Act of May 26, 1943, c. 104, Public No. 60, 78th Cong., 1st Sess.[2]

There is nothing peculiar to the present case which requires or justifies deviation from the pattern already set in decrees and compacts. While Colorado's bill of complaint alleges ownership by her of the waters of the Arkansas River above the Colorado-Kansas state-line (Bill of Complaint, paragraphs Fifth, Sixth, Seventh, Fourteenth, and Nineteenth) and these allegations have been put in issue by the answer of Kansas

---

[2] These are all the presently effective compacts involving an apportionment of interstate waters. National Resources Planning Board Technical Paper Number 5, "Interstate Water Compacts, 1785 to 1941," contains a convenient collection of all interstate water compacts, effective and not effective, to and including 1941. None of the ineffective compacts, other than that mentioned in footnote 1, *supra*, contains language materially variant from that of the compacts mentioned in the text.

(Separate Answer of the State of Kansas, paragraphs Fifth, Sixth, Seventh, Fourteenth, and Nineteenth), the determination of such an issue of law is not essential to the decision of this controversy. Indeed, Colorado itself now takes exception to the Special Master's inclusion of language relating to state ownership in the proposed decree. Colorado's Exceptions to the Report of the Special Master, paragraph VIII.

Of special concern to the United States is the fact that if the final decree contains language relating to state ownership of these waters, which are nonnavigable (Proposed Finding of Fact number Second, Report and Recommendations of the Special Master, p. 4), it might prejudge an issue of vital importance to the Government which is squarely raised and as yet undecided in *Nebraska v. Wyoming and Colorado, United States, Intervenor*, No. 7, Original, October Term, 1943. There the intervention of the United States specifically raises the question of federal as against state ownership of the unappropriated waters of nonnavigable streams. See the United States Petition of Intervention and the answers of the three States thereto. The question has been extensively argued by all parties before the Special Master in that case, who now has the matter under consideration.

In these circumstances it is suggested that the inclusion of language relating to state ownership

in the decree in the instant case is not necessary and should be avoided in view of the pendency of the problem in *Nebraska* v. *Wyoming*, No. 7, Original, October Term, 1943.

Respectfully submitted.

CHARLES FAHY,
Solicitor General.

SEPTEMBER, 1943.

U. S. GOVERNMENT PRINTING OFFICE: 1943

No. 5 Original

In The

SUPREME COURT OF THE UNITED STATES

October Term, 1943

THE STATE OF COLORADO, COMPLAINANT,

V.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USER'S ASSOCIATION, A CORPORATION, DEFENDANTS.

MEMORANDUM FOR THE STATE OF NEBRASKA, AMICUS CURIAE.

WALTER R. JOHNSON,
Attorney General of Nebraska,
Lincoln, Nebraska,
JOHN L. RIDDELL,
Assistant Attorney General of Nebraska,
York, Nebraska,
PAUL F. GOOD,
Special Counsel for Nebraska,
613 Security Mutual Building,
Lincoln, Nebraska,
For Amicus Curiae.

WEKESSER PUBLISHING CO., Law Briefs, Lincoln, Nebr.

No. 5 Original

In The

SUPREME COURT OF THE UNITED STATES

October Term, 1943

THE STATE OF COLORADO, COMPLAINANT,

V.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USER'S ASSOCIATION, A CORPORATION, DEFENDANTS.

MEMORANDUM FOR THE STATE OF NEBRASKA, AMICUS CURIAE.

WALTER R. JOHNSON,
Attorney General of Nebraska,
Lincoln, Nebraska,
JOHN L. RIDDELL,
Assistant Attorney General of Nebraska,
York, Nebraska,
PAUL F. GOOD,
Special Counsel for Nebraska,
613 Security Mutual Building,
Lincoln, Nebraska,
For Amicus Curiae.

In view of the memorandum filed for the United States, amicus curiae by the Solicitor General of the

United States recently, the State of Nebraska desires to have its position known. The memorandum for the United States refers to the case of *Nebraska* v. *Wyoming and Colorado, United States, Intervenor,* No. 7 Original, October Term, 1943. In that case, the State of Nebraska is compainant, the State of Wyoming the original defendant, the State of Colorado, impleaded defendant and the United States is intervenor. The issues in that case have been submitted to the Special Master upon written briefs and oral arguments. At the time of the preparation of this memorandum, he has not yet announced any decision.

The United States, in its intervention, has raised the issue of the claim of ownership by the United States of the unappropriated water of the stream involved, namely, the North Platte River. As finally presented in the briefs filed on behalf of the United States before the Special Master, certain qualifications are made of the claims of the United States. Since these are somewhat complex, it is unnecessary for us to attempt to state our understanding of them at this point. They are not stated in the memorandum filed herein for the United States, and since no one is asking a determination of those issues in this cause, their details are perhaps irrelevant. We believe, however, that the fact of the existence of such qualifications in the federal claims is one which should not be overlooked.

The State of Nebraska has no desire that the issues raised by the petition in intervention of the United States in the case of *Nebraska* v. *Wyoming, et al.,* should now be decided. We hope that we, as counsel for the State of Nebraska, will be given an opportunity to be heard

upon the issue. This opportunity will, of course, be afforded when the case of *Nebraska* v. *Wyoming, et al.*, is finally submitted to this court. It is not, as we understand it, directly raised in the pleadings or the briefs filed in the instant case. If the issue is, in fact, extraneous to the instant controversy, no harm will be done by eliminating it at this time even, though that might require the modification of the master's report as requested by counsel for the United States.

If, however, this court should be of the opinion that the question is necessarily involved and must be decided and settled at this time, we hope that an opportunity will be given to the State of Nebraska to file briefs and participate in any argument of that issue. We would suggest that probably in that event the United States and the State of Wyoming would like the same privilege, and no doubt, the privilege should be accorded to them as well as to us in the event that the court should wish to make a decision on the subject.

However, Nebraska joins in the request of the United States that the question be left open and not decided in this proceeding.

Respectfully submitted,

WALTER R. JOHNSON,
Attorney General of Nebraska,
Lincoln, Nebraska,

JOHN L. RIDDELL,
Assistant Attorney General of
Nebraska,
York, Nebraska,

PAUL F. GOOD,
Special Counsel for Nebraska,
613 Security Mutual Building,
Lincoln, Nebraska,
For Amicus Curiae.

No. 5 Original

In the Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a corporation, *Defendants*.

PETITION FOR REHEARING

A. B. MITCHELL,
Attorney General of Kansas,
Topeka, Kansas,

ELDON WALLINGFORD,
Assistant Attorney General,
Topeka, Kansas,

W. E. STANLEY,
First National Bank Building,
Wichita, Kansas,
Attorneys for the State of Kansas.

W. E. STANLEY,
Attorney for the Finney County Water Users' Association, a Corporation.

20-2103

In the Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, *Complainant*,

vs.

THE STATE OF KANSAS and THE FINNEY COUNTY WATER USERS' ASSOCIATION, a corporation, *Defendants*.

No. 5 Original

PETITION FOR REHEARING

The defendants herein respectfully petition this Honorable Court for a rehearing of this case for the following reasons:

1. The Court erred in its analysis of the evidence respecting depletion of the water supply by Colorado.

2. The Court erred with respect to Colorado ditch diversions.

3. The Court erred with respect to divertible water prior to 1907.

4. The Court erred in failing to properly consider or analyze Kansas and Colorado irrigated acreage.

5. The Court erred in failing to consider acreage in Colorado as a measure of permanent depletion of water supply.

6. The Court erred with respect to the damage of the substantial interests of Kansas.

7. The Court erred in assuming sites for feasible reservoir development in Western Kansas.

8. The Court erred in assuming that there is a question of the right of non-riparian irrigators in Western Kansas to divert water from the Arkansas River for irrigation.

While the foregoing represents some of the more obvious reasons reflected by the opinion of the Court for granting further opportunity for a more thorough examination of the facts as disclosed by a complete record, we further respectfully suggest that this Court by its decision has repudiated its previously announced doctrine of equitable apportionment of the waters of an interstate stream by permitting the unrestrained and unrestricted diversion by Colorado of all of the water physically divertible by it from the Arkansas River, and by refusing to grant the State of Kansas either relief from such diversions or a definition of the extent of that equitable share upon which in the future some reliance can be placed.

This Court, in submitting this matter to Judge Cav-

anah, selected as its Special Master a federal judge familiar through long years of experience, and through adjudication of rights with the principles and practices of irrigation. The Special Master of this Court placed before it a report in which all basic findings were resolved in favor of the contentions of the State of Kansas. Apparently the Court felt that there should have been included therein those specific portions of the record, and recitations of evidence upon which the Master relied, as additional findings of fact to support his basic conclusions.

It will be recalled that the Special Master herein was the Court's appointee. If, after more than a year's study of a most voluminous record and complicated exhibits, and the hearing of much testimony, a report was submitted to this Court which was not sufficiently detailed in the presentation of specific facts upon which he relied, it seems to defendants unfair that they should be penalized by such failure and by not having the matter re-referred to such Special Master, for further amplification in order that the Court might have the benefit of his exhaustive study and irrigation experience.

Instead of following such procedure, to which the defendants would not have objected, the Court repudiated entirely all of his basic findings of fact by attempting in a

period of less than 60 days to examine and understand a record of 39 volumes and some 368 complicated exhibits. Defendants respectfully submit that an understanding of this evidence was a physical impossibility in the time during which the Court had this matter under consideration. The result was that many undisputed and pertinent portions of the record, which defendants believe were controlling in the determination of this case, were overlooked by the Court.

Defendants urge that such procedure in dealing with the rights of a sovereign state does in all fairness call for a rehearing and a more extended examination of the record, either by the Court itself or by a re-reference to the same or another Special Master. In support of this application defendants here submit more specific detail respecting the errors of the Court reflected in its opinion.

The Court Erred in its Analysis of the Evidence Respecting Depletion of the Water Supply by Colorado.

The Court states at page 9 of its opinion:

> "The Master concludes that there has been a material increase in the depletion by Colorado, a consequent diminution of the flow across the state line, and injury to the substantial interests of Kansas. His report does not state what he considers material, or the extent of the diminution of flow . . ."

Rather than re-refer this to the Master, whose familiarity with the evidence was the result of months of close application and study of the entire record, the Court states, "We must therefore turn to the evidence to resolve the issues." In the Court's consideration of the evidence respecting depletion by Colorado, it fails to properly analyze the Kansas evidence, that since 1905 Colorado's use of water had increased by 300,000 acre-feet. The Court rejects this testimony as being incorrect, making the categorical statement respecting Witness Meeker, "On his own estimates the claimed average annual depletion of 300,000 acre-feet could not have taken place." The statement of the Court shows clearly that it has not followed sound principles, and that the conclusion is erroneous.

In any problem, regardless of its nature, involving use, consumption or depletion the following principles are axiomatic:

1. What is consumed or used is the difference between the original quantity and that which remains after the use is subtracted.
2. That determination of the amount of a progressive use or consumption over a period of time is the difference in the use at the beginning of the period and the use at the end of such period.

Defendants respectfully state that the Court has failed to recognize or follow either of these plain principles in

its analysis of undisputed evidence of river depletion between 1905, the close of evidence in the Kansas-Colorado case, and 1930.

As a basis for what follows we suggest the following simple problem as an example: Last week one has seven apples and eats five, having two left. This week one has 10 apples and eats eight, having two left. How many more apples were consumed this week than last week? The obvious answer is that, comparing last week with this week, there were three more apples eaten this week than last although the quantity remaining in each period was the same. Would this Court in dealing with this simple problem say that such answer was incorrect, and that if, as claimed, in order for three more apples to have been consumed this week than last, there would have to be not two apples left last week, but five? Certainly not. Yet this is exactly the reasoning of the Court set out in its opinion in rejecting the testimony of depletion of 300,000 acre-feet in the water supply by Colorado.

At page 9 of its opinion, after stating that the annual average state line flow during the period 1908 to 1930 was 260,700 acre-feet (a period, incidentally, that includes many of the years when progressive depletion was taking place), the Court then proceeds to make this statement:

> "If, as claimed, this flow remained after an additional annual depletion of 300,000 acre-feet by Colorado, the average annual flow in the earlier period (presumably state line flow) 1895 to 1908 would necessarily have been greater by 300,000 acre-feet, or would have averaged 560,700 acre-feet."

This statement could be correct only upon the erroneous assumption, unsupported by the evidence, that the basin water supply in that earlier period amounted to 1,240,000 acre-feet. Such assumption is not correct, and shows either a misunderstanding or a complete disregard of the evidence.

Although the evidence shows that a study of state line outflow, without reference to the total water supply, is of no value as a basis for determination of river depletion at the state line (R. 1579), and that a comparison of state line outflow with water supply by years is essential in determining water depletion (R. 1578-9), this Court has disregarded the existing water supply completely in arriving at its conclusions. If we take the periods selected by the Court and compare them properly the facts disclose:

Period	1895-1908		1908-1930	
Av. Water Supply	1,106,000 A. F.	(Kan.	1,350,000 A. F.	(Kan.
Av. State Line Outflow	408,000 A. F.	Exh. 70)	260,700 A. F.	Exh. 70)
Depletion in Average Supply by Consumption	698,000 A. F.		1,089,300 A. F.	

What then is the increase in consumption between the two periods:

Consumption	1908-1930	1,089,300 A. F.
Consumption	1895-1908	698,000 A. F.
Increase in Depletion		391,300 A. F.

Whether in comparing consumption in two selected periods the factor is water or apples, the principle is the same, and yet for the periods which the Court selected in its analysis of the evidence we find that the water supply was depleted in the latter period 1908 to 1930 to an average extent of 391,000 acre-feet, 91,000 acre feet more than the 300,000 acre-feet which Mr. Meeker testified was the extent of depletion since 1905. This amounts to a depletion by Colorado of 31 percent of the average annual water supply of 1,240,000 acre-feet, or 35 percent of the dependable water supply of 1,110,000 acre-feet. This decrease of approximately one-third of the water supply of a stream certainly is indicative of substantial damage to Kansas' interests.

The period selected by the Court for its comparison included in the earlier period three years following the conclusion of evidence in the Kansas-Colorado case, and eliminated them from consideration in the latter period.

If we use the period, 1895 to 1905, and compare it with

the period, 1906 to 1930, we have the following depletion indicated:

Period	1895-1905		(Kan.	1906-1930		(Kan.
Av. Water Supply	1,114,000	A. F.	Exh.	1,313,200	A. F.	Exh.
Av. State Line Outflow	439,000	A. F.	70)	297,100	A. F.	70)
Depletion in Average Supply by Consumption	675,000	A. F.		1,016,100	A. F.	
Depletion 1906-1930	1,016,100	A. F.				
Depletion 1895-1905	675,000	A. F.				
Increase in depletion	341,100	A. F.				

The selection and comparison of these two extended periods, the earlier with the later, is however, not a correct method of ascertaining the extent of depletion since the close of evidence in the old Kansas-Colorado case. Depletion is progressive.

The question concerning which Mr. Meeker, the Kansas witness, was testifying was the increase in depletion since the close of evidence in the Kansas-Colorado case in 1905, and this necessitated a determination of depletion as of that time, and the extent to which the water supply was depleted at the time of his testimony, or at the end of the period in 1930. This point was never considered or referred to by the Court in analyzing the testimony, that depletion had increased by 300,000 acre-feet since 1905.

Again, what are the facts? If we compare the period 1903-1907, the five years immediately preceding the decision in *Kansas v. Colorado*, with the five-year period,

1926 to 1930, the last period during which water supply figures were available, we find the following:

Period	1903-1907	1926-1930
Av. Water Supply	1,234,000 A. F.	1,312,000 A. F.
Av. State Line Outflow	472,000 A. F.	264,000 A. F.
Depletion in Average Supply by Consumption	762,000 A. F.	1,048,000 A. F.
Depletion 1926-1930	1,048,000 A. F.	
Depletion 1903-1907	762,000 A. F.	
Increase in depletion	286,000 A. F.	

Or, if we take the period from the commencement of the litigation to the close of testimony, namely 1901 to 1905, and compare it with the last five years with respect to which we have an analysis of the total water supply, we find the following:

Period	1901-1905	1926-1930
Av. Water Supply	1,118,000 A. F.	1,312,000 A. F.
Av. State Line Outflow	464,000 A. F.	264,000 A. F.
Depletion in Average Supply by Consumption	654,000 A. F.	1,048,000 A. F.
Depletion 1926-1930	1,048,000 A. F.	
Depletion 1901-1905	654,000 A. F.	
Increase in depletion	394,000 A. F.	

It is obvious that with an available water supply from year to year, some years plentiful and some years scarce, that a still further test of the extent of depletion is a comparison of years of similar water supply in the earlier period with those in the latter, such a comparison appearing at pages 94 to 99 of defendants' original brief, and being available to the Court will not be repeated here; but in

connection with this motion we respectfully ask that it be re-examined.

Defendants, however, make one comparison, which seems pertinent, between the years 1903 and 1905, where state line outflow was not estimated but measured by the U. S. G. S. This outflow can be compared with that of the later period of years, 1928 to 1930. In the years 1903 and 1905 the state line outflow averaged 674,300 acre-feet. In the last period of years, 1928 to 1930, the outflow was 264,000 acre-feet. This shows a diminution in state line outflow of 410,300 acre-feet between 1905 and the last five-year period. We admit that this is not an accurate basis of comparison, since there is no reference to the water supply, and a comparison only is made of state line flow, but it is the method used by the Court and set out in its opinion.

However, to use the proper method, reference must be made to the water supply available for consumption. If we do this, the facts are as follows:

Period	1903 & 1905	1926-1930
Av. Water Supply	1,410,000 A. F.	1,312,000 A. F.
Av. State Line Outflow	674,300 A. F.	264,000 A. F.
Depletion in Average Supply by Consumption	735,700 A. F.	1,048,800 A. F.
Depletion 1926-1930	1,048,000 A. F.	
	735,700 A. F.	
Increase in Depletion	312,300 A. F.	

This again substantiates Kansas' testimony of an increased consumption since 1905 of approximately 300,000 acre-feet.

If state line outflow for the years 1903 and 1905 is compared with the period 1931 to 1938, with respect to which latter period Colorado introduced evidence after the case was originally closed, we find that the outflow 1903 to 1905 amounted to 674,300 acre-feet. During the period 1931 to 1938 the outflow amounted to only 158,000 acre-feet. This shows that the state line outflow was less by 525,300 acre-feet in the latter period than it was at the time of testimony in the old Kansas-Colorado case. This again we respectfully point out was the identical method pursued by the Court in using state line outflow, without any reference to the water supply available for consumption.

Unfortunately, in the time allowed by the Master when the case was reopened it was impossible for engineers to produce a water supply study, which requires many months of work, for these later years.

Witness Meeker's testimony (R. 1564-1587) analyzed the facts respecting depletion. At R. 1565 he shows a Colorado consumption had reached 760,000 acre-feet by 1907, but had increased to 1,060,000 acre-feet by 1930, a difference of 300,000 acre-feet.

To the same effect is R. 1587. Further, at R. 1742 occurs the statement that since the close of testimony in the *Kansas v. Colorado* case consumption of water in Colorado has increased to the extent of 300,000 acre-feet of the average dependable supply. This is reflected by Kansas Exhibit 68, showing that in the five year period ending 1967 consumption was 68 percent of the average dependable supply, and in the five year period ending 1930 the consumption was 96 percent of the dependable supply, or an increase of 28 percent. 28 percent of 1,110,000, the amount found by the Special Master to be the dependable supply, and which was not disputed in the evidence, amounts to 310,800 acre-feet.

We submit that in the face of the foregoing facts, approached from almost any angle, in comparing periods at the close of the Kansas-Colorado case and the latter periods, the statement of the Court referring to Mr. Meeker's testimony, "On his own estimates the claimed average annual depletion could not have taken place," is erroneous, is contrary to the evidence, and is based upon an improper assumption that depletion can be determined by any other formula than the basic principle that use is measured by the difference between the water supply available for use and the residue remaining and passing across the state line after use has taken place.

Further, to say as the Court has, that the force of this evidence is weakened by Kansas' allegation in *Kansas v. Colorado*, Supra, to the effect that "In her bill in that case she alleged Colorado had totally destroyed the normal flow of the River, exclusive of floods, whereas she now asserts that the flow at the time of the earlier suit was such that Colorado has been able to deplete it on an annual average of 300,000 acre-feet," suggests a failure to distinguish between the issues in the two respective cases.

As pointed out at page 184 of Kansas' brief, in the old case Kansas sought an injunction to enjoin Colorado from diverting or using any of the water of the Arkansas River, and claimed the right to have the waters of that stream flow into Kansas undiminished. Normal flow and natural flow are synonymous. It is the flow of the river undiminished by irrigation uses. The facts in that case disclose that such original normal or natural flow had been destroyed by 1901. The record shows that the Canon City flows representing run-off from melting snows over the long-time average approximated only 45 percent of the total water supply. Assuming that this normal and expected run-off was completely consumed by the period of the old Kansas-Colorado case, there would still remain an average supply of 620,000 acre-feet remaining, which,

although consisting to some extent of flash run-off, was usable for irrigation purposes in both Kansas and Colorado, for as stated by Witness Patterson for Colorado, water is usable insofar as the diversion capacity can take it. Therefore, no one understanding the River and its characteristics would say that a destruction of the *normal* flow of the stream by the year 1901 would prevent further depletion of the water supply to an extent of 300,000 acre-feet of the average annual dependable supply.

The Court Erred With Respect to Colorado Ditch Diversions

The Court makes the following statement:

> "The records of Colorado's consumption and ditch diversions, and the Colorado and Kansas exhibits showing the divertible and usable state line flow, rebut such an increase as Kansas asserts." (an increase in consumption by Colorado to the extent of 300,000 acre-feet) Page 10 of opinion.

This again indicates a failure to relate basin water supply to the question of supply available for irrigation use.

Colorado's testimony and exhibits with respect to ditch diversions related only to that section of the River from Pueblo to the state line. Colorado Exhibit 118 (R. 3210) shows that in 1912 in that segment of the basin which

they selected as the basis for their testimony there were only 305,000 acres of land under irrigation as against 483,000 acres in the basin, or only 63 percent of the total irrigated acreage in that year.

It is true that Kansas Exhibit 96 (R. 1744) shows no substantial increase in the yearly ditch and canal diversions in Colorado from the period around 1912 to the period around 1930 between Canon City and the state line, but this again was a limited river section only, and was not intended to be taken as representing the water diverted for use in the entire basin. However, even in this limited section the record clearly shows, facts which the Court has overlooked (R. 5150 and following), that even in this section, where the acreage increase between 1912 and 1930 was only 37,000 acres (Kansas Exh. 56, R. 1513), the recorded diversions failed to include large quantities of water intercepted and used for irrigation purposes, which were never recorded. Certainly when the Court focuses its attention and arrives at its conclusion on the basis of a limited river section, rather than the entire basin, it calls for a re-examination of the facts respecting the entire area.

If the Court had taken occasion to examine the record respecting diversions for the entire basin, we respectfully

suggest that it could hardly have made the statement herein referred to, which defendants suggest was erroneous. Kansas Exhibit 133 (R. 7000) gives the Colorado State Engineer's records, taken from his bi-annual reports, showing the amount of water diverted in the Arkansas River basin as a whole. The facts set out in this exhibit were unchallenged by Colorado, and are undisputed on the record. This exhibit shows that the average of the basin diversions for the years 1908, 1910, 1911, 1912 and 1913, for which records were reflected by the Colorado reports, was 997,105 acre-feet. Comparing these with the last five years, 1932, 1933, 1935, 1936 and 1938 (omitting 1934 and 1937 because of obvious inaccuracies), the average annual diversions amounted to 1,391,732 acre-feet, or an increase of 394,637 acre-feet between the periods.

Colorado throughout the record attempted to focus testimony upon a limited river section between Pueblo and the state line, and the Court apparently confined its consideration to this limited and misleading picture, and failed to consider or even examine the records with respect to the basin in its entirety.

The Court further makes the statement respecting the variability of stream flow that "The main river below Canon City may be almost without water one day, run a

flood the next day, and on the following day be in practically its original condition." In making this statement the Court obviously cannot have carefully considered the undisputed testimony reflecting the flow of the stream below Canon City during the critical period of the growing season when the requirements of water for irrigation purposes is important.

An examination of that testimony, as reflected by the tables shown at pages 96 to 100 of Kansas' original brief, show that during the entire critical period of the growing season, May, June, July and August, for the entire period of 1912 to 1931, a total of 2,460 days, that in only 65 days of this entire period did the diversions by Colorado ditches go as low as the bracket indicating 1,000 to 750 second-feet. In 1,414 days of this same period ditch diversions were in excess of 2,000 second-feet, while in 624 days the diversions exceeded 3,000 second-feet.

Such undisputed facts as these hardly substantiate the Court's conception of a river almost without water below Canon City during a critical period of irrigation needs. We will agree that the quoted statement reveals an extremely accurate picture of the usual condition of the River at the state line after the flow has been rendered almost useless to meet irrigation needs by reason of Colo-

rado's depletion, for these same charts show that in this same period of 2,460 days, 1,637 indicated a flow of less than 200 second-feet passing the state line, while of these 1,637 days, 1,072 showed a flow of less than 50 second-feet, or substantially for irrigation purposes a dry stream.

The Court Erred With Respect to Divertible Water Prior to 1907

The Court, at page 12 of its opinion, makes the following statement:

> "It appears nevertheless that since 1904 an increased quantity of usable water has passed the state line, *for it is testified by Kansas' expert witness that between 1895 and 1902 no divertible water passed the line, and none betweer 1903 and 1907, except in 1903 and 1905.*"

Respectfully, we call the Court's attention to the fact that no such testimony appears in the record at any point. It clearly appears that the Court did not give sufficient attention to the record to ascertain what the undisputed facts were. It would seem that when the undisputed facts are that the average state line flow for the years 1903 and 1905 amounted to 674,300 acre feet, the Court should have realized it to be a rather violent assumption that no divertible water passed across the state line in the years from 1895 to 1908, with the exception of 1903 and 1905.

We quote the record on this point, referring to a discussion of Exhibit 70 appearing in Kansas' brief, page 76. At R. 1573 is the following:

> "*Question:* I note, Mr. Meeker, that certain of these columns have no black area (water divertible by Kansas canals April to October). I think they are all the years up to 1908, with the exception of the years 1903 and 1905, as I see it here. If I am correct, why are there no black areas on these other earlier years?
>
> "*Answer:* No records of daily flow were available for sufficiently long periods to prepare the quantity of divertible water by the Kansas canals.
>
> "*Question:* So these black portions had to be computed from actual daily flow?
>
> "*Answer:* That is true."

Again, at R. 1575 Mr. Meeker states:

> "These bars which do not bear the black portion at the base represent those years prior to the establishment of any records of daily flow from which computations could be made. Now there was no other basis for determining the black areas, and that was that all river flows of 25 second-feet, or under, were excluded for the reason of the evaporation losses in the river channel during the irrigation season."

When the record further shows that the average state line flow, 1895 to 1908, amounted to an average of 408,000 acre-feet annually (Kansas Exh. 70), as against an av-

erage state line flow, including the Holly drain, of 140,264 acre-feet from 1931 to 1940, inclusive (Colorado Exh. 193), such an erroneous statement as that here referred to on the part of the Court certainly calls for re-examination and re-appraisement.

The Court Erred in Failing to Properly Consider or Analyze Kansas and Colorado Irrigated Acreage

The acceptance by the Court of the United States census figure for 1939 of 469,535 acres under irrigation in the Arkansas River basin in Colorado as reflecting the true status of Colorado's irrigated acreage is to predicate its conclusions upon one year with a most abnormal condition of water shortage, and is to disregard completely both the normal conditions of stabilized use on the Arkansas River or the actual effect of the priority system in operation in Colorado.

The actual acreage in irrigation in the basin for each year are reflected in Kansas Exhibit 61 for the period 1895 to 1930, and by Colorado's Exhibit 196, page 1. These two exhibits taken together show that from 1915 until 1933, a period of nineteen years, the average irrigated acreage maintained in the Arkansas basin in Colorado amounted to an average of 521,000 acres. In only two years of this

entire period did the acreage fall below 500,000 acres. This occurred in the year 1922, when it dropped to 496,000 acres, and in 1933, when it likewise dropped to 496,000 acres.

If we accept this average as indicating a fairly stabilized condition, the increase in acreage from the time of the census in 1902 amounted to an increase of approximately 221,000 acres. What then is the significance of the acreage disclosed by the census of 1939 of only 469,535? Does this represent a condition or an isolated and misleading fact based upon abnormal conditions?

The record shows as an undisputed fact that in the operation of the priority system in Colorado ditches divert water from the stream to the extent of and in the order of their adjudicated priorities. Thus, in a period of water shortage late priorities are unable to divert, and if in any particular year of water shortage land is not served by water, it is, during that year eliminated from consideration in Colorado's computation of irrigated acreage, even though for the past ten years it has been irrigated, and with recurrence of normal water supply will again be irrigated in the future.

The methods used by the Water Commissioners in reporting irrigated acreage as only that acreage actually us-

ing water in a particular season is very clearly shown by the Record at pages 6826 to 6833. As stated by Colorado's Witness Patterson, at R. 6831, "I think the water supply, or as you call it 'the water opportunity' is one of the factors that tends to regulate or govern the variations in the amount of land irrigated." That the year 1939 was an exception and subnormal with respect to opportunity is clearly reflected by the record. For the year 1939 the Canon City flow measured only 381,160 acre-feet, or only 69 percent of the long-time average, only three years in the entire period from 1891 reflecting a lower mountain run-off. Likewise, during this same period the flow of the Purgatoire River, the main tributary of the Arkansas River, amounted to only 16,742 acre-feet (see Colorado Exhibit 193), and amounted to only 16 percent of the long-time average. The state line outflow into Kansas in 1939 amounted to only 51,989 acre-feet.

When the Court came to consider the extent of the acreage in Kansas being irrigated by diversion from the Arkansas River, many facts shown by the record were apparently overlooked. In the earlier period, in using United States Census data relating to such acreage, the Court apparently overlooked those portions of the record where gross errors in the census figures were pointed out

by Witness Knapp (R. 2356-57). The U. S. G. S. failed to include large quantities of irrigated acreage in Kansas.

The records of the Kansas State Board of Agriculture, which Colorado's Witness Patterson testified he had found unusually accurate, were completely disregarded. These records relating to Kansas' irrigated acreage are found in Kansas Exhibit 115, R. 2355, and show that in the year 1899 the total irrigated acreage in the three Western Kansas counties amounted to 42,513. At this particular time there was no pump irrigation in Western Kansas. In fact, there was no pump irrigation in this area until some time after the conclusion of evidence in the Kansas-Colorado case. So that the entire 42,513 acres were all irrigated by diversions from the River under the existing ditches in the western counties.

The situation in 1939 relative to irrigated acreage in Kansas is not disputed, and is clearly disclosed by the testimony of Colorado's Witness Patterson (R. 6837-39). He further testified (R. 6561) that the number of acres remaining under irrigation in the western counties in Kansas dependent upon the surface flow of the River amounted to 22,428. These figures correctly portray the true situation of the Kansas ditches with respect to their efforts to divert water from the Arkansas River for irri-

gation. In view of the fact that the Court in its consideration of irrigated acreages in both states based its conclusions concerning Colorado upon an isolated and abnormally low year, and relative to Kansas failed to consider the extent to which its acreage irrigated by diversion from the River had been reduced, it would seem that fairness would call for a re-examination of the evidence respecting these factors.

The Court Erred in Failing to Consider Acreage in Colorado as a Measure of Permanent Depletion of Water Supply.

The Court at page 11 of its opinion states:

> "Thus, a total of about 170,000 additional acres has been put under irrigation since 1902. On its face this record would seem to indicate a large increase of consumptive use by Colorado, but the acreage under irrigation does not afford a reliable measure of actual consumption."

In the first place, the Court in arriving at the figure of 170,000 additional acreage since 1902 utilized the acreage obtaining water in the extremely dry year of 1939, an isolated and exceptional year, rather than the average acreage maintained under irrigation. This would have been a fair and more comprehensive approach, since it would reflect the amount of acreage irrigated in the Arkansas

River basin under the usual and expected water supply conditions. Had the Court done this, and taken the average of acreage irrigated each year since 1915 (a date which fairly reflects the additions of new acreage to the irrigated area), there would have been disclosed an average irrigated acreage covering a period of twenty-five years of 509,000 acres, which would have indicated an increase in irrigated acreage since 1902 of 209,000 acres, and this 209,000 acres would represent the true factor of the additional burden imposed upon the water supply since the year 1902.

When the Court rejects the implications of the permanent burden placed upon such water supply of the basin by this additional acreage by stating that "Acreage under irrigation does not afford a reliable measure of actual consumption," it overlooks completely the real issue in this case, which is one of permanent depletion of water supply.

The Court in the case of *Kansas v. Colorado* advisedly used the language:

> "At the same time it was obvious that *if the depletion* of waters of the River by Colorado continues to increase, there will come a time when Kansas may justly say there is no longer an equitable division of the benefits,"

and further in the decree:

> "Whenever it shall appear that through a MATERIAL INCREASE IN THE DEPLETION of the waters of the Arkansas by Colorado . . ."

Since the term depletion connotes a permanent condition, we submit to the Court for re-examination the fact that acreage is the truest measure of the permanent burden which can be placed upon the water supply of any stream.

We submit to the Court that defendants did not at any point in their original brief indicate that acreage was a reliable measure of actual consumption. Defendants did state, and here again urge, that it is an accurate measure of the extent of permanent stabilized consumption, which represents the permanent burden for all time placed upon the River by irrigation uses. As the Court correctly pointed out:

> "When first turned in the water is rapidly absorbed by the subsoil, with consequent high consumption. By continued irrigation the subsoil becomes saturated, the water table rises, and water in increasing quantities flows back to the stream."

What the Court does overlook is that there is a point below which consumption can never fall, which is represented by the complete consumption of water in irrigation

uses through evaporation and consumption for plant growth. This is recognized by irrigation authorities as permanent stabilized consumption, and represents the permanent burden of water depletion which the irrigation of a given acre of land imposes upon the water supply of any stream.

As Colorado's testimony indicates (R. 4372), consumption under stabilized conditions in the Arkansas River basin would represent a factor of 1.9 acre-feet per acre. If we take the 209,000 acre increase, that increase in acreage, as long as the same is irrigated, is bound to impose a complete and permanent depletion of water supply to the extent of 209,000 times 1.9, or 397,000 acre-feet of totally consumed water, which, except for the imposition of such acreage upon stream flow, would otherwise be susceptible to use; or if the Court prefers to use the increase of 170,000 acres, this increase in acreage would represent a permanent depletion to the extent of 323,000 acre-feet of the water supply.

In the case of *Kansas v. Colorado*, Mr. Carpenter, one of Colorado's main witnesses, testified as to the manner through which the development of seepage and return flow, through instances on the Platte River, would develop a much more stabilized water supply for areas lower

down on the stream. This probably was persuasive upon the Court at that time that Colorado had not then so permanently depleted the water supply as to have invaded Kansas' right. Defendants here assert that had the acreage then indicated by the Court, namely 300,115 acres, been maintained as the permanent burden upon the water supply in Colorado, at the present Kansas would have an ample water supply from which, with the existing diversion capacity of her ditches, amounting to 2,000 acre-feet, she could be irrigating upwards of 150,000 acres of land, but when with each succeeding year all existing return flows were completely recaptured and utilized within the State of Colorado, and an additional burden to the extent of over 300,000 acre-feet of the water supply was imposed upon the stream, the water users in the State of Kansas were thereby deprived of what the Supreme Court in the old case referred to as their right to the like beneficial effects of a flowing stream.

We therefore re-assert, and ask for further consideration of these facts which the record shows conclusively represents one of the truest measures of permanent depletion of water supply, and which indicates the permanent depletion since the old case to be an amount in excess of 300,000 acre-feet.

It should be further interesting to the Court that a permanent depletion of the water supply of the basin, whether approached from the angle of a complete analysis of the water supply with relation to its outflow at the state line, or whether approached from the completely different position of the extent of the increase in irrigated acreage, is proved to be in excess of 300,000 acre-feet.

The Court Erred With Respect to the Damage of the Substantial Interests of Kansas

The Court in its opinion apparently rejects its previously announced doctrine that as between two states on an interstate stream there should be an equitable apportionment of the benefits thereof. The defendants had assumed that the invasion of such an equitable right, which this Court had previously said existed, constituted damage, and, that even though the extent of Kansas' share in the flow of the stream had not heretofore been defined, as a sovereign state she had a right to seek from the Supreme Court a definition of those rights and redress against an invasion thereof. The Court, however, apparently narrows the conception of damage to the sole fact that Kansas must show a reduction of her acreage irrigated from the waters of the River, or else be denied relief.

The Court states:

> "The acreage under irrigation in Western Kansas through existing ditches has steadily increased over the period 1895 to 1939 from approximately 15,000 acres to approximately 56,000 acres."

This is not a correct statement of the facts disclosed by the record. As heretofore pointed out in a previous section, the acreage irrigated in 1899, which was entirely and exclusively by diversions from the River, amounted to 42,513 acres (Kansas Exh. 115, R. 2355), and according to Colorado's own witness, Mr. Patterson, the amount which is now attempting to irrigate by diversions from the River has dropped to 22,428 acres. (R. 6561). These facts show that, even though ditches were in existence with a diversion capacity of 2,000 second-feet, there was a decrease of 47 percent in the acreage irrigating by ditches from the flow of the Arkansas River. During this same period the irrigated acreage in Colorado increased by 44 percent. We respectfully suggest that this fact alone constitutes substantial damage, where the question of irrigation by diversion from the waters of an interstate stream is involved, and more particularly since in the case of *Kansas v. Colorado* in defining the rights of the respective states to the use of waters of the Arkansas River for irrigation purposes used this language:

> "To secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of the like beneficial effects of a flowing stream."

Again the Court states in its opinion:

> "Tables taken from the United States Census show that in 1899 the acreage irrigated in these counties (the three western Kansas counties) was 6 percent of that irrigated in the Colorado basin, in 1909 was 7 percent, in 1929, 9.7 percent, and in 1939, 10.7 percent. It seems that Colorado cannot have depleted the usable supply passing into Kansas if acreage under irrigation is any measure of depletion."

In arrinving at such percentages it is obvious that the Court resorted to Census data respecting the Kansas acreage, grossly in error, which errors were pointed out in the record, R. 2356-2357. Had the Court utilized the acreage under irrigation by the Kansas ditches from the flow of the Arkansas River, it would have reached an entirely different result. It would have been shown that in the year 1899 as against a total acreage in the Arkansas basin in Colorado of 325,000 there were 42,513 acres in Kansas diverting water by ditches from the Arkansas River, or 13 percent. It would further have been disclosed that in 1939 the acreage remaining in Kansas diverting solely from the Arkansas River had decreased to 22,428 (R. 6561), and that this amounted to only 4.7 percent of

the Colorado acreage irrigated in that year, and only 4.3 percent of the average irrigated acreage maintained continuously under irrigation in Colorado during the period 1915 to 1932.

If the Court had visualized the actual condition as reflected by the tables at pages 110 to 114, inclusive, of defendants' original brief, which disclosed that during the growing season from May to September over a period of 20 years, or a total of 3,340 days, that in 1905 of these days a flow of less than 100 second-feet passed across the state line, while in 1,359 days of the same period the flow had been reduced to less than 50 second-feet, it would have understood why in order to attempt to preserve any semblance of irrigation many farmers under existing ditches were compelled to put in pumping plants to secure water. The statement of the Court, however, that such pumping is made at low initial and maintenance cost, as compared with direct irrigation under already constructed ditches, is contrary to all fact, and there is nothing in the entire record to support any such conclusion.

The Court Erred in Assuming Sites for Feasible Reservoir Development in Western Kansas

The Court stated that:

> "Though western Kansas affords sites for similar storage reservoirs, but one small basin has been constructed in that State."

It is true that but one storage reservoir has been constructed in Kansas in the area in question. It is not true that Western Kansas affords reservoir sites similar to those in Colorado, which are feasible or practical under existing conditions for development.

Colorado's Exhibit 139, found in Appendix "B" of Colorado's Original Brief must have been the basis for the Court's statement. It is unfortunate that the Court did not read the testimony in the record concerning this exhibit. Upon cross-examination Engineer Tipton, who prepared the exhibit, testified that he had studied only two of the reservoir sites described in the exhibit. He further testified that with reference to those two he had made little study concerning the *economic feasibility* of the projects. Relative to one of the sites studied he stated he was not prepared to say that it was economically feasible. The other he stated was feasible from the standpoint of water available, but he had not considered

loss by percolation, evaporation and transportation (R. 4812). With reference to the two sites studied by Engineer Tipton, Engineer Knapp testified at some length, his testimony beginning at page 5186 of the record and continuing to page 5198. Engineer Knapp showed that the two reservoirs were not practicable or economically feasible for a number of reasons, among them being an insufficient supply of water to justify the cost of construction; the limited life of a reservoir because of siltation, and in one instance to the difficulty entailed in transporting water through a canal over a considerable distance to the proposed site.

The Court Erred in Assuming That There Is a Question of the Right of Non Riparian Irrigators in Western Kansas to Divert Water From the Arkansas River for Irrigation.

The Court stated that there is serious question whether lands (in Kansas) which are not riparian may divert the water from the stream for irrigation.

The Court in making this statement referred to the Kansas Statute of 1886, and to two opinions of the Kansas Supreme Court relating to controversies over the use of water by riparian owners. The Court comments on the failure of Kansas in its brief and argument to refer

to the Kansas decisions, and to the fact that no showing was made with respect to the right of non-riparian owners to appropriate waters against objection by other such owners.

The true facts are that practically every acre of land irrigated in Kansas, in the area which is the subject matter of this dispute, is non-riparian land and from the beginning of irrigation in that region ample authority has existed under statute for such use, and because of such statutory authority no objection can be raised by anyone to such use.

Section 5, Article 2, Chapter 23, General Statutes of Kansas, 1868, authorized the formation of private corporations:

> "For the construction and maintenance of canals for the purposes of irrigation or manufacturing purposes."

This statute was amended in 1876 by Chapter 58 of the Laws of 1876 to include the following proviso:

> "That it shall be unlawful for any corporation or person to locate or construct any irrigating canal along or upon any stream in such manner as to interfere with or in any wise hinder, delay or injury any milling or irrigating improvements already constructed or located along or upon any

stream of water, or to diminish the supply of water flowing to or through any established irrigating canal."

The validity of these statutes has never been challenged in Kansas Courts although some Kansas ditches were constructed to irrigate non-riparian land as early as 1879.

As previously stated it is quite obvious from the opinion that the Court has not made a complete and exhaustive study of the evidence in this case. It was physically impossible for the Court to have done so in the limited time available. A considerable number of those facts asserted by the Court in its opinion defendants have hereinbefore demonstrated to be in error.

The Special Master, appointed by the Court, of necessity spent many months studying the record. In addition the Special Master heard some of the testimony and had the opportunity to observe some of the witnesses. Apparently the Court feels that the Special Master selected by it could and should have supported his basic conclusions with the supporting evidence he believed, and should have shown to the Court why other evidence was discarded by him. Kansas should not, however, be penalized for the failure of the Special Master to do so.

The basic conclusions arrived at by the Special Master,

defendants believe, were correct. An abundance of competent undisputed testimony supporting his conclusions is contained in the record. It seems only fair and reasonable that the Court, rather than to discard the findings of the Master, should have given the same careful consideration to the evidence that the Master did; or, in the alternative, the Court should have referred the matter back to the Master, instructing him to corroborate his findings with evidence contained in the record.

This Court in *Kansas v. Colorado,* 206 U. S. 46, first stated the principle of the equitable apportionment of the waters of an interstate stream. That principle has been reasserted in numerous cases since that time, and given practical application in at least two instances (*Wisconsin v. Illinois,* 281 U. S. 179, and *Wyoming v. Colorado,* 259 U. S. 419). If the decision rendered in this case is permitted to stand that principle becomes only a theory with no practical value.

The Federal Constitution recognizes but two methods of determining disputes between states. Such disputes may only be determined by interstate compact or by a decision of this Court. The two states involved in the controversy are aware of the fact that such controversies may best be determined by interstate compact; they

also know that this Court has previously stated its preference that disputed matters between states be so settled where possible. Only recently such a compact involving the waters of another stream common to the two states was agreed upon. That course of action, however, is not always feasible and such is the case here. Through many years of changing administrations in both states officials have worked diligently and in good faith to agree to a fair division of the waters of the Arkansas River.

Either of the two states could very profitably use all of the waters of the Arkansas River, if properly regulated, for irrigation purposes. This being so, the possibility of agreement becomes necessarily one of compromise. Since Colorado has the first opportunity to divert the waters of the Arkansas River, if this Court refuses to take jurisdiction, and thus removes the possibility of compulsion by Court action, no reason other than that of good will exists for Colorado to compromise. Good will has not heretofore been shown to be a controlling factor when in competition with financial gain or loss.

Expert engineers have spent many years and thousands of dollars in producing the evidence introduced in this case. A very considerable amount of that evidence should be preserved by being included in a decision rendered by

this Court. If this Court has not the time to do so, the matter should be again referred to a special master in order that the basic facts be determined, together with instructions as to the extent to which the Court desires a recitation of the evidence relied upon by such master. Sound precedent exists for such action. In *Wisconsin v. Illinois*, supra, the Court referred the case three times to the Special Master Charles Evans Hughes.

Upon the basis of all of the foregoing, defendants respectfully request a re-hearing, with ample time allowed in which to file a complete abstract of the record; or in the event that a thorough examination of such record imposes too heavy a burden upon the time of the Court, that the matter be either rereferred to the present Special Master, who is thoroughly familiar with the evidence, with directions as to the detail which the Court demands in its special findings and conclusions, or to some other special master whom this Court could instruct in advance as to the requirements respecting detailing evidence which it will require in such report.

Respectfully submitted,

A. B. MITCHELL,
Attorney General of Kansas,
Topeka, Kansas,
ELDON WALLINGFORD,
Assistant Attorney General,
Topeka, Kansas,
W. E. STANLEY,
First National Bank Building,
Wichita, Kansas,
Attorneys for the State of Kansas.
W. E. STANLEY,
Attorney for the Finney County Water Users' Association, a Corporation.

Certificate

STATE OF KANSAS, SHAWNEE COUNTY, ss.

I, A. B. Mitchell, Attorney General of the State of Kansas, one of counsel appearing for the defendants in the above entitled action, hereby certify that I have read the Petition for rehearing, have assisted in the preparation of the same, and know the contents thereof, and that said petition is presented in good faith and not for delay.

A. B. MITCHELL,
Attorney General of Kansas.

20-2103

p. 6,

SUPREME COURT OF THE UNITED STATES.

No. 5, Original.—October Term, 1943.

The State of Colorado, Complainant,
vs.
The State of Kansas, et al.
} Bill in Equity.

[December 6, 1943.]

Mr. Justice Roberts delivered the opinion of the Court.

This suit is the latest of a series of litigations between Kansas, or her citizens, and Colorado, or her citizens, concerning their respective rights to the beneficial use of the waters of the Arkansas River.

The river has its origin in central Colorado, and is a mountain torrent for 130 miles to a point near Canon City where it enters a foothill region ending near Pueblo. Thence it traverses the high plains of eastern Colorado and western Kansas. In the areas mentioned the stream is non-navigable.

In 1901 Kansas brought suit against Colorado in this court for an injunction restraining the latter from diverting, or permitting anyone under her authority to divert, waters of the river within Colorado, and for general relief. *Kansas* v. *Colorado*, 206 U. S. 46.[1] Kansas in her bill alleged that the waters of the river had been used for irrigation in her western counties and that, after establishment of these uses, Colorado began systematically to appropriate and divert them between Canon City and the Kansas state line for irrigating non-riparian arid lands; that, by 1891, all the natural flow, and much of the flood waters, had been appropriated in Colorado so that the average flow had been greatly reduced and the natural flow completely cut off.

Colorado replied that the stream was not continuous except at times of flood; that, in a state of nature, its bed east of Pueblo was frequently dry; that Colorado and her citizens had diverted and used only the perennial flow above Canon City and what had been done in effect conserved water for delivery into Kansas.

[1] The court overruled a demurrer to the bill and required Colorado to answer. Kansas v. Colorado, 185 U. S. 125.

She denied she had substantially diminished the flow of the river at the state line. She asserted she was entitled to consume the entire flow; but alleged that, in any view, her total appropriations did not amount to an infringement of Kansas' rights calling for judicial interference.

The court denied Kansas' contention that she was entitled to have the stream flow as it flowed in a state of nature. It denied Colorado's claim that she could dispose of all the waters within her borders, and owed no obligation to pass any of them on to Kansas. It declared that as each state had an equality of right each stood before the court on the same level as the other; that inquiry was not confined to the question whether any portion of the river waters were withheld by Colorado but must include the effect of what had been done upon the conditions in the respective states; and that the court must adjust the dispute on the basis of equality of rights to secure, so far as possible, to Colorado, the benefits of irrigation, without depriving Kansas of the benefits of a flowing stream. The measure of the reciprocal rights and obligations of the states was declared to be an equitable apportionment of the benefits of the river. The court added that, before the developments in Colorado consequent upon irrigation were to be destroyed or materially affected, Kansas must show not merely some technical right but one which carried corresponding benefits.

On examination of the proofs, the court concluded that diversions authorized by Colorado embraced more water than the total flow at Canon City. It found, however, that no clear showing was made as to what surplus water, if any, was contributed by the tributaries below that point or as to the proportion of the diverted water returned to the river by seepage. The opinion described the diversions in each state, analyzed the use made of the water and the benefits derived from it in each, considered population tables and agricultural statistics bearing upon the growth of the communities adjacent to the river in each, and stated conclusions, now material, as follows: That the result of Colorado's appropriations had been beneficial reclamation of many acres; that, while the influence of Colorado's diversions had been of perceptible injury to portions of the Arkansas valley in Kansas, yet to the great body of the valley the diminution of

flow had worked little, if any, detriment; that regarding the interests of both states, and the right of each to receive benefit through irrigation and otherwise from the waters of the stream, the court was not satisfied that Kansas had made out a case entitling it to a decree. The court added that if depletion by Colorado continued to increase there would come a time when Kansas might justly say that there was no longer an equitable distribution of benefits and might rightly call for relief against Colorado and her citizens. Accordingly the bill was dismissed without prejudice to future action by Kansas. The taking of evidence ended June 16, 1905, and the decision of the court was announced May 13, 1907.

October 30, 1909, the Finney County Water Users' Association, which maintained the so-called Farmers Ditch in Kansas, applied to a Kansas court for adjudication of priorities as between various Kansas users of the river water. One of the defendants, the United States Irrigating Company, removed the cause to the United States District Court. A consent decree was entered May 16, 1911, which provided for the allocation and rotation of use amongst certain, but not all, the Kansas ditches, including the Farmers' Ditch. It was, however, provided that the settlement should remain binding upon the parties only until the adjudication of other litigation next to be noticed.

August 27, 1910, United States Irrigating Company sued Graham Ditch Co. and others holding Colorado priorities, in the United States District Court for Colorado, to obtain an adjudication of priorities as between Kansas users and Colorado users. The Finney County Association was denied leave to intervene. Evidence was taken, but the suit was settled by a contract of February 19, 1916. By this settlement, the Colorado defendants agreed to recognize priorities as of August 27, 1910, for all the Kansas ditches in Finney County except the Farmers' Ditch; not to apply for, or claim, priorities for storage purposes on the Purgatoire River, a tributary of the Arkansas, or below the mouth of the Purgatoire, of a date earlier than August 27, 1910; and to pay the costs of suit and an additional sum to the Kansas interests. The Kansas ditches agreed to accept the priority date of August 27, 1910, and the quantities of water specified in the contract, as a definition and

determination of their rights. The defendants complied with the terms of the contract.

The Finney County Association declined to become a party to the contract and, on November 27, 1916, brought suit in the United States District Court for Colorado against the same defendants for relief like that sought in the United States Irrigating Company's suit. January 29, 1923, the Finney County Association brought a second suit in the same court against other Colorado defendants for similar relief. January 24, 1928, Colorado filed the present bill against Kansas and the Finney County Association.

After formal recitals, the bill refers to our earlier decision, states that, in reliance upon it, money has been spent in the improvement of the irrigation systems in Colorado, recites the prior and the pending private litigation against Colorado appropriators, alleges that the establishment of an interstate priority schedule sought in the pending suits would disrupt and destroy Colorado's administration of the waters of the Arkansas basin and result in conflict of state authority, asserts that no proper settlement of the relative rights of the States can be obtained in suits by Kansas appropriators against Colorado appropriators, outlines other injury to Colorado threatened by prosecution of the pending cases to judgment, and prays that the Finney County Association be enjoined from further pressing those suits, that Kansas and her citizens be enjoined from litigating, or attempting to litigate, the relative rights of the two states and their citizens to the waters of the river on claims similar to those made by the Association in its pending suits, and that the rights of Colorado and her citizens as determined by the judgment in *Kansas* v. *Colorado* be protected.

Kansas' answer admits some allegations of the bill and denies others, sets forth her alleged rights in the waters of the river, recites appropriations by Kansas residents and citizens, diversions by Colorado citizens under appropriations junior in time and inferior in right to those made in Kansas, and asserts that, since the filing of the complaint in *Kansas* v. *Colorado*, Colorado users have largely increased their appropriations and diversions, and threaten further to increase them, to the injury of Kansas users. She prays that the court protect and quiet her rights and those of her citizens and residents, including the Finney County Association, to their appropriations, that the rights of her citizens and

residents to divert water from the river for irrigation be decreed in second feet and that Colorado, her officers, agents, and citizens be perpetually enjoined from diverting any waters from the river or its tributaries in Colorado until the rights of Kansas, her citizens and residents, are satisfied.

The Finney County Association filed an answer admitting and denying averments of the bill and affirmatively praying that Colorado and her citizens be enjoined from diverting water from the river until the Association's right to 250 second feet is satisfied. The issues were made up by Colorado's reply.

Pursuant to our order, evidence was taken by a Commissioner. Thereupon the cause was referred to a Master with leave to take additional evidence, and direction, in the light of all the evidence, to state findings of fact, conclusions of law, and to recommend a form of decree. The evidence consists of some seven thousand typewritten pages of testimony and 368 exhibits covering thousands of pages.

The Master states that the "evidence is voluminous and conflicting on many of the material issues of fact", but his report contains no discussion or analysis of the proofs. Apart from formal recitals, the report consists of fourteen findings of fact,—more properly conclusions of fact,—nine conclusions of law, and a recommended form of decree. Each party has filed exceptions.

Three questions emerge from the pleadings. (1) Is Colorado entitled to an injunction against the further prosecution of litigation by Kansas users against Colorado users? (2) Does the situation call for allocation of the waters of the basin as between Colorado and Kansas in second feet or acre feet? (3) Has Kansas proved that Colorado has substantially and injuriously aggravated conditions which existed at the time of her earlier suit?

The Master concluded that the first question should be answered in the affirmative. Kansas has not excepted to the conclusion or to the corresponding provisions of the proposed decree.

Bearing upon the second question, the Master found that "the average annual natural flow of the river and its tributaries" is 1,240,000 acre-feet, and the "average annual dependable and fairly continuous water supply and flow" 1,110,000 acre feet. He recommends that the dependable flow be allocated 925,000 acre feet to Colorado and 185,000 acre feet to Kansas, 150,000 thereof between

April 1 and October 1, and 35,000 between October 1 and April 1 of each year, that is, five-sixths to Colorado and one-sixth to Kansas. He submits a form of decree embodying this allocation and adjusting required deliveries in the same proportions upward or downward in accordance with annual flows in excess of, or less than, the stated average annual dependable flow. He has not attempted to define flood waters or the extent to which they are usable by either state, and suggests no provision whereby their occurrence may be taken into account in defining Colorado's obligation to deliver water to Kansas. The form of decree requires measurement of flow by gauges, one at Canon City and the other at the mouth of the Purgatoire, and deliveries to Kansas prorated to the total of the flows at those points.

Both States except to these features of the decree as ambiguous and impossible of administration. Kansas, while asserting that the award to her is inadequate, professes her willingness to accept the recommended allocation, but insists that the decree require Colorado to deliver the quantity of water awarded to Kansas when and as demanded by her. Colorado asserts that the recommended decree,—much more Kansas' proposed amendment,—would entail serious and unjustified damage to her interests, if indeed compliance with its terms were possible.

In respect of the third question, the Master finds:

"There has been since the taking of testimony in the case of Kansas against Colorado cited in 206 U. S. 46, in 1907, a material increase in the river depletion by Colorado of the water supply of the Arkansas River, which has been consumed and used by Colorado users for irrigation purposes and which has diminished the flow of the water into the State of Kansas and that by reason thereof there has been injuries to the substantial interests in Kansas."

No exception is taken to the Master's recommendation that an injunction issue against further prosecution of the Finney County Association suits against Colorado. In our view such an injunction is appropriate, and should be granted.

Colorado urges that our decision in *Kansas* v. *Colorado*, *supra*, amounted to an allocation of the flow of the Arkansas River between the two States. We cannot accept this view. In that case Kansas labored under a burden of proof applicable in litigation between quasi-sovereign states, of which more hereafter. The dismissal of her bill resulted from the conclusion that she

had failed to sustain the burden. But from the decision then rendered it follows that unless Kansas can show a present situation materially different from that disclosed in the earlier case she cannot now obtain relief.

The prayer of Kansas for an apportionment in second-feet or acre feet cannot be granted. In our former decision we ruled that Kansas was not entitled to a specific share of the waters as they flowed in a state of nature, that it did not then appear that Colorado had appropriated more than her equitable share of the flow, and that if Kansas were later to be accorded relief, she must show additional takings working serious injuries to her substantial interests. This was in accord with other decisions in similar controversies.[2]

The reason for judicial caution in adjudicating the relative rights of states in such cases is that, while we have jurisdiction of such disputes,[3] they involve the interests of quasi-sovereigns, present complicated and delicate questions, and, due to the possibility of future change of conditions, necessitate expert administration rather than judicial imposition of a hard and fast rule. Such controversies may appropriately be composed by negotiation and agreement, pursuant to the compact clause of the Federal constitution. We say of this case, as the court has said of interstate differences of like nature, that such mutual accommodation and agreement should, if possible, be the medium of settlement, instead of invocation of our adjudicatory power.[4]

It follows that the Master erred in attempting to divide what he designated as the "average annual dependable" water supply of the Arkansas River in Colorado into fractions and awarding those fractions to the states respectively. Such a controversy

---

[2] See the cases in notes 3, 4 and 6 *infra*. In New Jersey v. New York, 283 U. S. 336, 347, the prayer of Pennsylvania for such an allocation was denied. Wyoming v. Colorado, 259 U. S. 419, is not an exception. As it happened, the doctrine of appropriation had always prevailed in each of the states there concerned and furnished the most appropriate and accurate measure of their respective rights of appropriation of the flow of the Laramie River. It was, therefore, possible in enforcing equitable apportionment, to limit the amount of water which Colorado might, without injury to Wyoming's interests, divert to another water shed, to an amount not exceeding the unappropriated flow.

[3] Missouri v. Illinois, 180 U. S. 208; Kansas v. Colorado, 206 U. S. 46, 95–98.

[4] See Washington v. Oregon, 214 U. S. 205, 218; Minnesota v. Wisconsin, 252 U. S. 273, 283; New York v. New Jersey, 256 U. S. 296, 313. Compare the Colorado River Compact of Nov. 24, 1922, authorized by Act of August 19, 1921, 42 Stat. 171, and dismissed in Arizona v. California, 292 U. S. 341, 345; and compare Wiederlieder v. La Plata R. & C. C. Dutch Co., 304 U. S. 92.

as is here presented is not to be determined as if it were one between two private riparian proprietors or appropriators.[5]

The lower state is not entitled to have the stream flow as it would in nature regardless of need or use.[6] If, then, the upper state is devoting the water to a beneficial use, the question to be decided, in the light of existing conditions in both states, is whether, and to what extent, her action injures the lower state and her citizens by depriving them of a like, or an equally valuable, beneficial use.[7]

We come now to the vital question whether Kansas has made good her claim to relief founded on the charge that Colorado has, since our prior decision, increased depletion of the water supply to the material damage of Kansas' substantial interests. The question must be answered in the light of rules of decision appropriate to the quality of the parties and the nature of the suit.

In such disputes as this, the court is conscious of the great and serious caution with which it is necessary to approach the inquiry whether a case is proved. Not every matter which would warrant resort to equity by one citizen against another would justify our interference with the action of a state, for the burden on the complaining state is much greater than that generally required to be borne by private parties. Before the court will intervene the case must be of serious magnitude and fully and clearly proved.[8] And in determining whether one state is using, or threatening to use, more than its equitable share of the benefits of a stream, all the factors which create equities in favor of one state or the other must be weighed as of the date when the controversy is mooted.

On this record there can be no doubt that a decree such as the Master recommends, or an amendment or enlargement of that decree in the form Kansas asks, would inflict serious damage on existing agricultural interests in Colorado. How great the injury would be it is difficult to determine, but certainly the proposed decree would operate to deprive some citizens of Colorado, to some

---

[5] Kansas v. Colorado, *supra*, 100.

[6] Colorado v. Kansas, *supra*, 85, 101-102; Connecticut v. Massachusetts, 282 U. S. 660, 669-670; Washington v. Oregon, 297 U. S. 517 523, 526.

[7] Cases cited in Note 8.

[8] Missouri v. Illinois, 200 U. S. 496, 520-521; New York v. New Jersey, 256 U. S. 296, 309; North Dakota v. Minnesota, 263 U. S. 365, 374; Connecticut v. Massachusetts, 282 U. S. 660, 669; Alabama v. Arizona, 291 U. S. 286, 292, Washington v. Oregon, 297 U. S. 517, 522.

extent, of their means of support. It might indeed result in the abandonment of valuable improvements and actual migration from farms. Through practice of irrigation, Colorado's agriculture in the basin has grown steadily for fifty years. With this development has gone a large investment in canals, reservoirs, and farms. The progress has been open. The facts were of common knowledge.

The controversy was litigated in 1901. Kansas was denied relief in 1907. The dispute between appropriators in the two states was brought into court in 1910 and settled in 1916. The Finney County Association sued Colorado appropriators in 1916 and 1923. Even if Kansas' claims of increased depletion and ensuing damage are taken at face value, it is nevertheless evident that while improvements based upon irrigation went forward in Colorado for twenty-one years, Kansas took no action until Colorado filed the instant complaint in 1928.

These facts might well preclude the award of the relief Kansas asks. But in any event, they gravely add to the burden she would otherwise bear, and must be weighed in estimating the equities of the case.[9]

The Master concludes that there has been a material increase in depletion by Colorado, a consequent diminution of flow across the state line, and injury to the substantial interests of Kansas. His report does not state what he considers material; or the extent of the diminution of flow; or the interests of Kansas which have been injured and the extent of the injury. We must, therefore, turn to the evidence to resolve the issues.

Kansas asserts that since the decision of *Kansas* v. *Colorado*, *supra*, Colorado has increased her consumptive use of the water of the Arkansas River by an annual average of between 300,000 and 400,000 acre feet. Witnesses so testified and, to support their conclusions, submitted elaborate calculations and analyses exhibiting the alleged total water supply of the river basin in Colorado and the alleged amount of water passing in the bed of the stream across the state line. A witness submitted tables covering the period 1895-1930 from which he deduced an average yearly water supply of 1,240,000 acre feet and an average annual dependable supply of 1,110,000 acre feet. He presented figures to show that Colorado's consumptive use had increased to the extent of an annual average of 300,000 acre feet. He reached this result by

[9] Washington v. Oregon, 297 U. S. 517, 526.

using estimated flow across the state line between 1895 and 1908 and measured flow between 1908 and 1930, during which period a gauging station was maintained at Holly near the line. Measurements indicate that, during the latter period, the average annual state line flow was 260,700 acre feet.[10] If, as claimed, this flow remained after an additional average annual depletion of 300,000 acre feet by Colorado, the average annual flow in the earlier period, 1895 to 1908, would necessarily have been greater by 300,000, or would have averaged 560,700 acre feet. The witness' own exhibit shows that he assumed an average annual state line flow for the period 1895-1899 of 300,000 acre feet, for 1900-1904, of 470,000 acre feet, and, for 1905-1909, of 454,000 acre feet, or an annual average over the total period, 1895-1909, of 408,000 acre feet. On his own estimates the claimed average annual depletion of 300,000 acre feet could not have taken place. Moreover, the force of this evidence is weakened by Kansas' allegations in *Kansas* v. *Colorado supra*. In her bill in that case she alleged Colorado had totally destroyed the normal flow of the river exclusive of floods whereas she now asserts that the flow at the time of the earlier suit was such that Colorado has been able to deplete it on an annual average of 300,000 acre feet.

The records of Colorado's consumption and ditch diversions, and the Colorado and Kansas exhibits showing the divertible and usable state line flow, rebut such an increase as Kansas asserts. Kansas' expert witness himself testified that the diversion records show no material change in Colorado diversions since 1905 and that if acreage in Colorado has expanded under the ditches on the main stem of the river it has done so because of an improved duty of water; that, during the period, the river gains due to return flow have increased, the consumptive use of water has declined, and relatively the stream flows have improved.

The Kansas ditches are capable of diverting water only up to 2,000 c. f. s. When the flow is greater the excess cannot be diverted and used. It is admitted that the character of the flow of the river in Colorado is variable from year to year, from season to season, and from day to day, and the main river below Canon City may

[10] In computing average annual flows, flood waters are included in the reckoning. As later shown, such annual averages do not represent the quantities of water usable by diversion ditches for irrigation.

be almost without water one day, run a flood the next day, and, on the following day, be in practically its original condition. Thus it appears that both in Colorado and in Kansas there may at one time be flood water unavailable for direct diversion and, at another, not enough water to supply the capacity of diversion ditches. The critical matter is the amount of divertible flow at times when water is most needed for irrigation. Calculations of average annual flow, which include flood flows, are, therefore, not helpful in ascertaining the dependable supply of water usable for irrigation. That supply has, in Colorado, been supplemented by the extensive use of reservoirs for storage of flood waters and winter flows not usable or needed for irrigation. Though western Kansas affords sites for similar storage reservoirs, but one small basin has been constructed in that State. On the other hand, the storage in Colorado, and the release of stored water to supplement the natural flow of the stream in times of need, operates by seepage and return to the channel to stabilize and improve the flow at the state line and, to that extent, benefits irrigation in Kansas.

Kansas relies heavily upon the increase of irrigated acreage in Colorado since our decision in 1907. The testimony in the earlier case was closed in 1905. The then latest available census,—for 1902,—reported 300,115 acres under irrigation in the Arkansas basin in Colorado. In its opinion the court referred to this figure. The next census,—for 1909,—gives the Colorado acreage as 464,236. The later reports disclose an addition of less than 5,000 acres between 1909 and 1939. Thus a total of about 170,000 additional acres has been put under irrigation since 1902. On its face this record would seem to indicate a large increase of consumptive use by Colorado, but the acreage under irrigation does not afford a reliable measure of actual consumption. When first turned in, the water is rapidly absorbed by the sub-soil with consequent high consumption. By continued irrigation the sub-soil becomes saturated, the water table rises, and water, in increasing quantities, flows back to the stream. Ultimately consumption falls well below diversion. The returned water again may be diverted and again supply return flows. Since the decision in the earlier case, studies of return flows have been made which indicate a steady reduction in the quantity of water consumed per acre of irrigated land.

Practically all of the affected Kansas ditches are in three western counties. Tables taken from the United States census show that, in 1899, acreage irrigated in these counties was 6% of that irrigated in the Colorado basin. In 1909 it was 7%, in 1929, 9.7%, and, in 1939, 10.7%. It seems that Colorado cannot have depleted the usable supply passing into Kansas if acreage under irrigation is any measure of depletion.

Whatever may be said of the practices of Colorado since 1905, Kansas is not entitled to relief unless she shows they clearly have entailed serious damage to her substantial interests and those of her citizens. It is not necessary to quote the findings of this court made in the earlier case. We need only say they disclose that some ditches in western Kansas had been abandoned for lack of available water and all ditches were suffering from shortages of flow. The court pointed out that Colorado had authorized diversions in excess of the flow at Canon City. And the record in the present case indicates that, except for seepage and return flow, the appropriations Colorado has authorized from the basin, as a whole, exceed the available dependable flow of the stream and its tributaries, and this appears to have been true also in 1901. It appears, nevertheless, that, since 1904, an increased quantity of usable water has passed the state line, for it is testified by Kansas' expert witness that, between 1895 and 1902, no divertible water passed the line and none between 1903 and 1907, except in 1903 and 1905, whereas, in each year since 1908 divertible water has crossed the state line, in varying quantities and, in most years, in substantial amounts.

Kansas, however, insists that 414,000 acres in western Kansas are susceptible of successful irrigation, and much of this land would have been irrigated had Colorado not deprived Kansas of her equitable share of the flow. The evidence is that the acreage now irrigated in Kansas lies close to the river and along the river bottom. The land claimed to be susceptible of irrigation extends many miles from the bed of the river. We are asked to speculate as to how much of this land would have been put under irrigation under more favorable circumstances.

As has been pointed out, despite Colorado's alleged increased depletion, the acreage under irrigation in western Kansas through existing ditches has steadily increased, over the period 1895-1939, from approximately 15,000 acres to approximately 56,000 acres.

Moreover, the arid lands in western Kansas are underlaid at shallow depths with great quantities of ground water available for irrigation by pumping at low initial and maintenance cost. There is persuasive testimony that farmers who could be served from existing ditches have elected not to take water therefrom but to instal pumping systems because of lower cost.

Again, there is serious question whether lands which are not riparian may divert the water from the stream for irrigation. In the earlier suit Kansas asserted,[11] and the court held,[12] that the common law prevailed in Kansas and governed the rights of riparian owners. It is true that the rule as to riparian rights has been expanded by the common law of Kansas to permit a riparian proprietor reasonable use of the waters of a stream for irrigation.[13] But such use is subject to the rights of other riparian owners to a like reasonable use. What is reasonable must, in each instance, be determined in the light of total supply and total need of all riparian owners.[14] It is also true that, beginning in 1886, Kansas, by statutes recognized appropriation for irrigation. But there is doubt whether the privilege is not restricted to riparian owners in some portions of the state. The Supreme Court of Kansas has held that, where a title originates in a grant antedating the Act of 1886, the right of appropriation is limited by the common law as to riparian rights, which are rights of property derived from the original patent or deed in the line of title.[15] It seems that title to much of the land along the Arkansas Valley in western Kansas was originally granted or patented prior to 1886. The brief and argument of Kansas, while referring to the statutes of the state authorizing appropriation, make no reference to the Kansas decisions and no showing with respect to the right of non-riparian owners to appropriate waters against objection by other such owners.

The official census figures submitted bearing upon population of the western counties of Kansas, and the agricultural production in them, give no support to a claim that the inhabitants have

[11] 206 U. S. 51, 52, 58, 59, 60, 61.

[12] *Ibid.*, 95, 99, 102, 104.

[13] Campbell *v.* Grimes, 64 Pac. 62.

[14] Clark *v.* Allaman, 71 Kan. 206.

[15] Frizell *v.* Bindley, 144 Kan. 84. Cf. Smith *v.* Miller, 147 Kan. 40; 75 P. 2d 273.

suffered for lack of arable and productive land. Generally speaking, the population has steadily increased and the agricultural production has also risen throughout the period in question.

All these considerations persuade us that Kansas has not sustained her allegations that Colorado's use has materially increased, and that the increase has worked a serious detriment to the substantial interests of Kansas.

A decree should be entered enjoining the further prosecution of the Finney County Association's suits, and dismissing the prayers of both States for other relief. The parties may submit such a decree.

A true copy.

Test:

Clerk, Supreme Court, U. S.